40 Rock ©

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Vol 4 No 1

Acorn's C confirmed

ACORN has now confirmed that it is to launch a 'C' computer next year (see *Popular Computing Weekly*, December 20)

The 'C' will be an Acorn developed machine, and not part of the BBC's range. 'C' stands for 'communicator' and the machine is planned to be a direct competitor for ICL's new QL based One Per Desk (OPD)

The Acorn C micro is likely to feature a telephone handset at least 128K Ram a flat screen, liquid crystal display, and built in disc drive, and use the pseudo 16-bit 65C816 chip, which is pin-compatible with the 6502.

According to Acorn's managing director Chris Curry, the C will undercut ICL's OPD, which sells for £1,500 The price for the C is expected to be pitched between £500 and £800

The development of the 'C' which will eventually appear in several versions, has been kept a closely guarded secret. "The research team have been working in offices completely separate from Acorn's headquarters to help prevent news leaking out," said Acorn's marketing manager Gwyn Mathews

The first C micro is unlikely to be launched before this summer

```
WITH A TERRIBLE GRINDING OF GEARS THE
BULLDOZER COMES TO AN ABRUPT HALT JUST
IN FRONT OF YOU. IT SMOKES, SHUDDERS,
AND EMITS NOXIOUS SUBSTANCES ALL OVER
YOUR ROSE BED. PROSSER IS INCOHERENT
WITH RAGE.

MOMENTS LATER, YOUR FRIEND FORD PREFECT
ARRIVES. HE HARDLY SEEMS TO NOTICE YOUR
PREDICAMENT, BUT KEEPS GLANCING
NERVOUSLY AT THE SKY. HE SAYS "HELLO,
ARTHUR," TAKES A TOWEL FROM HIS BATTERED
LEATHER SATCHEL, AND OFFERS IT TO YOU.

>TAKE TOWEL
AS YOU TAKE IT, FORD SAYS "ER, LOOK,
THANKS FOR LENDING ME THE TOWEL. BEEN
NICE KNOWING YOU... GOT TO GO NOW." HE
SMILES ODDLY AND WALKS DOWN THE COUNTRY
LANE.

>
```

Hitchhiker's Guide on C64

THE Hitchhikers Guide to the Galaxy, which started as a radio series on the BBC, and became four books a TV series, two records and a stage show, has now been launched as a computer game

American adventure giant Infocom has released Hitchhikers as a text-only adventure using sophisticated input, and the ability to 'talk' to other characters in the game.

While the opening scenario is similar to that of the original story, the adventure does not rigidly follow the action thereafter

The player takes the part of Arthur Dent befriended by the seemingly human Ford Prefect, who helps Arthur escape to his native planet, Beetlejuice 5 while Earth is demolished to make way for an interstellar by-pass Their intergalactic adventures form the plot of the story

Currently the *Hitchhikers Guide to the Galaxy* is available only for the Apple II in the UK, but a Commodore 64 version should be imported within the next two months.

Lynx comes out of hibernation

CAMPUTERS which after seven months in liquidation was bought last week, has a new range of hard disc based micros at an advanced stage of development.

The assets of Camputers, and the rights to the name Lynx have been bought by a company Anston Technology for a sum reported to be around £24 000

Anston Technology was set up specifically to buy Camputers by Alan Chapman of Braefield-Chapman, a company which Camputers subcontracted to package and ship the Lynx computers, and Dick Greenwood, formerly Camputers chairman.

"We will be manufacturing again, although it is too early to say now which direction Anston Technology will go in," said

continued on page 5 ▶



INSIDE ⟩ ENTERPRISE 64 REVIEW — WORTH THE WAIT? ⟩

commodore 64

Alice IN VIDEOLAND



PURE MAGIC!

Join Alice in her journey through Videoland - an enchanted place populated by strange creatures such as bread-and-butterflies and pipe smoking caterpillars, where little girls change size and flamingos turn into croquet mallets!

Alice in Videoland is a revolutionary new concept in entertainment for the Commodore 64, incorporating some of the finest graphics ever seen on any home computer accompanied by a charming musical score There are four different game scenes involved, and your performance in earlier ones will affect your ability to get through later ones and determine your eventual total score

Scene One Stunning title page graphics give way to the first game scene as Alice falls into the rabbit's warren Score points for collecting the objects to be found there - including keys to open doors, bottles to make her smaller, cakes to make her bigger!

Scene Two - Out in the garden the Cheshire cat looks on as Alice meets the pipe-smoking caterpillar Help her to catch the bread-and-butterflies and the rocking-horse flies that change into the balls used in the croquet game in the last scene!

Scene Three Alice is a pawn in the chess game where her opponents are the Jabberwocky and Tweedledum and Tweedledee Help her across the board by protecting her with your White Knights!

Scene Four - The most bizarre croquet game ever! Help Alice hit the balls through the playing-card-soldier hoops before the Queen of Hearts stomps on them!

Alice in Videoland is available for the Commodore 64 on disk - £12 95, and now on cassette - £8 95

Alice in Videoland features graphics created with the Koala Pad

Audiogenic LTD

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Vol 4 No 1



) View

All the signs point to a big shake out among software houses in the coming 12 months

On the face of it any reduction in the number of companies producing software looks like a bad thing resulting in fewer programs to choose from.

The problem is that too many companies are producing average quality titles in big enticing packaging. How many times have you bought a program in a fancy box which turned out to be hopeless? All too often I suspect

People can only be expected to fall for that trick once though, as a number of companies are now discovering to their cost.

The most encouraging aspect of the current upheavals is that sheer weight of money is not enough.

Some very big companies — household names — have dipped their toes in the software water — and found the going tough. Yet a good program still sells, even if it comes from a small new company — like Gargoyle or Microsphere for example

British Telecom recently paid an unprecedented sum for the Z80 rights to *Elite*, but it will only see that money back if the conversions are technically excellent.

The current uncertainties have made companies a little nervous. Last week the industry held its annual awards presenting itself with twenty or so awards — none of which recognised positive achievement in 1984 — take the Software House In Trouble Award as being fairly typical.

Yet, the companies which survive the shake-out will be the ones which produce the most original and technically superior titles.

And the result should be a strengthened industry with fewer, better programs.

) Presents...

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) Futures...

Next week a special feature issue — everything you need to know about music and micros — why the one cannot be without the other

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How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work

Computer Trade Association Magazine of the Year

(Continued from page 1)

Camputers

Dick Greenwood. "I have been brought in at Anston as a consultant, and at the moment I am correlating all the information regarding technical, sales and marketing aspects to the computers.

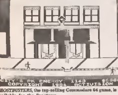
We have also bought remaining stocks of Camputers machines and peripherals, which will all be available from Anston.'

Camputers' former managing director Stanley Charles is not currently involved with the new company "I've had discussions with the new owners and expect to be meeting with them soon," said Stanley

"I am delighted that someone has purchased the project, although with the amount of time the company has been down, some radical changes will need to be made.

"When the company went into liquidation, there were plans in development for a complete new range of machines, including a new machine using semi-hard discs with a huge storage capacity. The prototype of that machine was shown at the Paris Micro Expose in May last year, and very little work would be needed to complete it," he continued.

Ghostbusters hits the Spectrum



***GHOSTBUSTERS*, the top-selling Commodore 64 game, is now available for the Spectrum.**

The game, produced by Activision, is closely based on the hit film of the same name

The quality of the speech and music which characterised the Commodore version has, inevitably, had to be modified for the Spectrum, but the strategy and plot of the game itself remains the same An MSX version is also being developed, to be launched in the next two months. *Ghostbusters* on the Spectrum costs £9 99

Tansoft expands Oric catalogue

TANSOFT has begun expanding its catalogue of programs for the Oric by completing negotiations to market titles in the UK by leading French software houses.

The Oric Atmos, despite its lack of success in Britain, is a market leader in France, where it apparently outsells the Spectrum.

"We are currently evaluating software from a number of French companies, including Innelec Infogrammes and ASN which distributes the Oric Atmos in France," said Tansoft's Adrian Rushmore.

"Tansoft's aim is to build up a bumper catalogue using as many French titles as we can. We hope to begin launching the programs by the end of January — the first titles will be mainly arcade and strategy games, though there will be at least one graphic adventure"

Tansoft is also building up a catalogue of non-Atmos games, a new step for the company, which has produced exclusively for the Oric 1 and Atmos until now

"We have acquired the catalogue of Voyager Software, which includes titles such as *Quasar* and *Grabit* for the Commodore 64, *Avenger* on the Dragon, *Trilogy* on the Vic 20, *Crazy Crane* on the Spectrum and *Forbidden Fruit* for the BBC, Commodore and Spectrum. Six more non-Oric games from freelance authors will be added this month. All of these will almost certainly be converted for the Atmos," Adrian continued.

Prices for either the French games or the other titles have not yet been fixed, but all should be available by the end of this month.

Pocket TV shortage

SINCLAIR has once again fallen into the 'supply and demand' trap The numbers of its pocket TV available before Christmas fell far short of orders placed.

The TV was distributed to three retail outlets, John Lewis, British Home Stores and W H Smiths in the second week of December

"We've had enough to supply about twelve models per branch," said a John Lewis spokesman. "They sold out very quickly Our next batch will arrive, we hope, at the end of January' The picture is the same at British Home Stores and W H Smith.

"I don't know when the next lot is due to arrive," said BHS's consumer electronics buyer Martin Wallington.

A spokeswoman for W H Smith commented "a few are still coming in each week, and



we are concentrating supplies at our shop at Waterloo Station and Heathrow Terminal 2

A spokesman for Sinclair commented, "The pocket TV was intended as a pre-Christmas launch in very limited quantities and Sinclair made that quite clear to all the retailers concerned. Production at Timex in Dundee is set to step up sharply in the first quarter of this year The ultimate target is to produce one million per year, though that won't necessarily be in 1985"

Software by bar codes

REDWOOD Publishing has released a bar code reader to replace the laborious typing in of printed computer program listings.

The company also publishes bar-code versions of programs listed in its magazine *Acorn User* The bar-codes are the same format as is used to label many items of supermarket food and books Instead of typing in the listing, the user simply draws the reader — a pen-like device which plugs into the user port on the computer — across each line of bar codes to input the lines into the micro

Redwood introduced both the bar-code listings and the reader in conjunction with the Microelectronics Education Programme and Addison-Wesley, the book publisher

The reader, together with the software to drive it, costs £60 44, and each book of listings £1

Details from Redwood, 68 Long Acre, London WC2.

Quicksilva split

MARK Eyles and Caroline Haydon the last two members of the original team which set up Quicksilva three years ago have left the company

They have left to set up a new company making holograms.

The two have built one of the few holographic laser studios in the country to produce commercial white-light viewable holograms. Explained Mark, "We will be making both reflection and transmission types of hologram and hope to produce the first batch within the next month."

Rod Cousens, Quicksilva's managing director, said, "Mark has always been interested in holographics, and developed the idea for the company a while ago It was very sad to see them both go, as they had been at Quicksilva for three years, and are close friends"

While neither Mark nor Caroline are to be replaced by Quicksilva, the company is to expand its marketing and in-house programming team.

Letters

Atari winners

I cannot agree with your comments in your recent editorial that Atari games are inferior to Spectrum and Commodore titles.

The problem is not quality but availability and price. Atari's recent price reductions and trend towards disc-based software should open up the possibilities for a proper comparison. Additionally, if software houses such as Llamasoft can convert more 'winners' for the Atari the machine's excellent graphics and sound would be apparent to a wider audience. Everyone seems to forget that most of what is happening on the Spectrum and the C64 has already happened on the Atari years ago.

Before the Spectrum and C64 people put up with awful programs only because they couldn't afford an Atari. In the last couple of years Atari may have paid the price for its complacency, but things are different now under Mr Tramiel.

Look out, Sinclair and Commodore.

Paul Strong
48 Rockford Avenue
Shenfield
Brentwood
Essex

Distribution problems

I would like to make a couple of points about the present situation of software distribution.

I tried for weeks to obtain a Spectrum game by CRL called *Olympics* from Boots, W H Smith and Tesco without success. They all stated that they had had several enquiries about the program, but it was up to Websters, and Websters alone, whether they would stock the game.

As CRL do not appear to advertise their games as much as most of the other major software houses, I can only assume that Websters feels that without this support, a game will not sell.

If that is the case, then I believe that both companies have lost out on this particular game, as it is surely the best of all the games based on the Olympics, on the market, as you actually have to run against opposition (not only against the clock), graphics do not vanish during events, and your keyboard or joystick is unlikely to be ruined after a few plays.

Fortunately, there are a few good software stockists who eventually get most of the new releases, but those people who do not purchase magazines or rely on the big stores to stock the new games, inevitably lose out in the present distribution situation.

J Keene
34 Headley Road
Surbiton
Surrey

Avoid completely

I am the creator/programmer/copyright holder of the Commodore 64 game *Havoc*, currently living in Amsterdam to recover from the ordeal. (I have a very nice squat and can often be seen begging guilders at Central Station.)

While thumbing through magazines in the station bookshop I was very upset to see a review of a Spectrum version of my game (if one could call it a 'version'). I have not seen this Spectrum program and could not bear to see it.

Having worked extremely hard on the original C64 *Havoc*, I'd like to make it perfectly clear to Spectrum owners that I had absolutely nothing to do with it and I can assure them that I feel worse about it than they.

I can only repeat your reviewer's advice to your readers: Avoid completely.

What more can I say except 'pass the sick-bag'?

A G Osborne
c/o 18 Cotswold Close
Basingstoke
Hants

"Hallo? Redwood Publishing? I'm having trouble with one of your listings. When it says 'thick thin thin, thick' shouldn't it be 'thick thin, thick thin'?"

Excellent investment

I was interested to read your review of the *Payroll Plus 64* program in the December 13 issue.

As a user of the program in a firm of solicitors, I would like to establish the reasons why we chose such a system in our office.

All our accounting functions, credit control, etc, are installed on a multi-user hard disc system, and for us to have installed a pay roll system on the same equipment would have cost a four figure sum of money in software alone. This of course does not allow for the additional cost of up-dating the package, and maintenance.

Therefore, as a firm having a total pay-roll of approximately 40, we find the *Payroll Plus 64* an excellent investment and to date we have had no problems whatsoever, and have found that every eventuality has been accounted (!) for.

B E Ramsden
1 Harpham Road
Marschapel
nr Grimsby

Terrifying bugs

I was fascinated to read David Nowotnik's astounding revelations (December 13 issue) about the unreliability of the QL's Superbasic.

This came as quite a shock to me as I had been programming the thing for more than five months without noticing all these terrifying bugs in my midst.

It seems to me that there is a simple explanation for every one of his problems with Superbasic.

I'll tackle the 'lack of memory' problem first. The reason for the 4096 bytes being used for nothing is that this figure includes 256 bytes of Basic pointers and the return stack used for *Gosubs* and procedure calls.

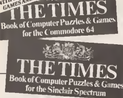
Why that 14K program used 20624 bytes is rather harder to understand. To start with it wasn't a 14K program because each sector of a microdrive actually contains 512 bytes of data. Multiplying 33 by 512 gives a total space of 16896 bytes and adding this to the 4K system overhead gives 20992 bytes used by his program. But this still leaves 5632 bytes unaccounted for. This memory is the difference in size between the ASCII version of the program stored on microdrive and the tokenised version of the program which is actually executed by the interpreter. This includes an overhead for the variable name lists and the variable value lists. Although this tokenisation is rather wasteful of memory, I'm afraid that's the price you have to pay for all the extended features that form the 'Super' in Super Basic. Despite this I have already written some very large programs on the QL so I can attest to the fact that there is no real problem with its memory.

Now to get to the easy stuff. When I first discovered the 'Out of memory' error of which David Nowotnik speaks, I attributed it to a failure of error trapping to detect that the maximum number of channels had been exceeded. Exceeding this number causes some rather strange things to happen which culminate in the machine crashing. In my use of the machine I have avoided this problem by simply using less than 15 channels at any one time, which for about 98% of programming applications should be sufficient.

So I would recommend budding SuperBasic programmers to work without trepidation providing they follow the golden rule of programming — 'if in doubt back it up', preferably on several different microdrives.

If you do this the bugs which remain in SuperBasic should become nothing more than minor niggles.

Stephen Hill
51 Carver Road
Boston
Lincs



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Escape

Can you fly over the border in your balloon and escape from the east. . .on the CBM64 by Stuart Myler

The object of this game is to find a way across the sky, making sure not to hit a mine, or crash into a fighter or helicopter, then exit on the right hand side of the screen. (You must be high in the sky at this point, or you crash.)

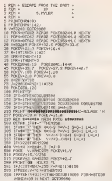
Completing each screen moves you on to a harder one, until finally you safely guide your balloon over the border fence. You then have the task of manouvering your balloon down a volcano avoiding the clouds of volcanic gas.

Use *Z* and *X* to move left/right, *F3* and *F5* to move up/down, and *F1* to start the game. Leaving the title screen for 30 seconds puts the program into demo mode. Have fun!

Program Notes

Line No	
5	Disable CBM Key
6	Characters into u/case.
8	Goto title screen.
10-12	Read sprite data.
20-28	Set sprite colours etc.
80	Repeat keys.
100	Clear screen.
150-158	If S=(0 to 3) goto next screen.
295	Print high score.
300-315	Move balloon routine.
580-582	Print balloon, score etc.
590-593	Detect collision.
594-596	Detect if balloon is on a certain section of the screen.
600	Goto start of main program.
9000-9088	Sprite data.
9200-9210	Finishing routine.
9800-9820	Routine if air current is missed.
9850-9860	Routine if you burst balloon.
9900-9905	Title screen.
10000-10090	Sound routines.
10095-10120	Demo routine.





```
1 REM + ESCAPE FROM THE EAST +
2 REM +          BY           +
3 REM +       S.MYLER         +
4 REM +                       +
5 PRINTCHR$(8)
6 PRINTCHR$(142)
8 V=53248 GOTO9900
10 FORN=0TO62 READA POKE832+N,A NEXTN
11 FORN=0TO62 READB POKE896+N,B NEXTN
12 FORN=0TO62 READC POKE960+N,C NEXTN
20 V=53248 POKEV+32,6 POKEV+33,6
30 POKEV+21,3 POKEV+16,4
37 R=INT(RND(1)*2)
38 IFR=0THENT=12
39 IFR=1THENT=5
40 POKE2040,13 POKE2041,14+R
45 POKEV+39,7 POKEV+27,2 POKEV+40,T
50 POKEV,100 POKEV+1,20
55 POKEV+2,0 POKEV+3,0
70 X=20 Y=100
75 J=290 K=RND(1)*150
80 POKE650,128
100 PRINT"J"
150 IFS=0THENGOSUB9500
152 IFS=1THENGOSUB9500 GOSUB9600
154 IFS=2THENGOSUB9500 GOSUB9600 GOSUB9700
158 IFS=3THENGOSUB9100 W=W-.5
295 PRINT "HI-MILAGE "H
297 POKEV+30,0 POKEV+31,0
299 REM ****** MAIN PROG ******
300 GETA$ IFA$="" THEN350
301 IFA$="X"THEN X=X+3 Y=Y+1 G=G-1 L=L+1
305 IFA$="Z"THEN X=X-3 Y=Y+1 G=G-1 L=L-1
310 IFA$="" THEN Y=Y-4 X=X+1 G=G-1 L=L+1
315 IFA$="" THEN Y=Y+3 X=X+1 L=L+1
350 IFY>220THEN9200
400 Y=Y+W X=X+W+.3 J=J-5
500 POKE V,XAND255 POKEV+1,Y
510 POKEV+16,X/256
515 POKEV+3,KAND255 POKEV+2,J
580 PRINT " MILES "L
582 IFJ<20THENJ=255 K=RND(1)*150
585 IFPEEK(V+31)=0THEN593
590 IFPEEK(V+31)=1THENGOSUB10000 FORH=0TO30
    POKEV+39,H NEXT GOTO9850
591 IFPEEK(V+31)=3THENGOSUB10000 FORH=0TO30
    POKEV+39,H NEXT GOTO9850
593 IFPEEK(V+30)=3THENGOSUB10050 FORH=0TO30
    POKEV+39,H NEXT POKEV+40,6 GOT
594 IFX<280THEN300
595 IFX>290ANDY<150THENS=S+1 L=L+100 W=W+.2 GOTO30
596 IFX>290ANDY>150THEN9800
```

```
590 IFY>-220THEN9200
600 GOTO300
8999 REM +++++ DATA FOR BALLOON +++++
9000 DATA0,255,0,3,255,192,3,255,192,7,255,224
9010 DATA15,255,240,15,255,240,15,255,240,7,255,224
9020 DATA7,255,224,3,255,192,2,255,160,1,127,64
9030 DATA1,62,64,0,156,128,0,156,128,0,73,0,0,73,0
9031 REM
9032 REM
9033 REM
9034 REM
9035 REM
9036 REM
9037 REM
9040 DATA0,62,0,0,62,0,0,62,0,0,28
9049 REM ++ DATA FOR GERMAN FIGHTER ++
9050 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,6,0,0
     6,64,253,14,65,4,14
9060 DATA79,255,254,223,255,255,223,255,255,79,255
     254,64,0,0,0,0,0,0,0
9070 DATA ,,,, ,,,, , ,
9079 REM + DATA FOR GERMAN HELECOPTER +
9080 DATA0,12,0,122,122,0,15,128,0,1,224,0
9082 DATA1,30,0,7,128,0,12,142,1,16,224,1
9084 DATA16,252,2,32,247,195,96,232,62,128,247,196
9086 DATA255,252,0,127,224,0,63,192,0,31,192,0
9088 DATA0,128,0,0,128,0,140,240,0,132,0,0,0,0,0
9100 REM # LAST BOARD #
9105 PRINT"J" POKE53280,0 POKE53281,0
9110 PRINTTAB(30)"" PRINTTAB(29)""
9112 PRINTTAB(30)""
9114 PRINTTAB(12)"" PRINTTAB(11),""
9116 PRINTTAB(12)""
9118 PRINT"
9120 PRINTTAB(15)"
9122 PRINTTAB(14)"
9124 PRINTTAB(12)"
9126 PRINT"
9127 PRINT"
9128 PRINT"
9129 PRINT"
9130 PRINT"
9131 PRINT"
9132 PRINT"
9133 PRINT"
9134 PRINT"
9139 PRINT"
9140 FORK=0TO520STEP80 POKE1057+K,81 POKE55329+K,0 NEXT
9150 POKE1137,160 POKE55409,1
9180 RETURN
9200 REM # FINISHED #
9202 POKEV+35,0 POKEV+40,0 PRINT"J"
9205 FORA=0TO24 PRINT" WELL DONE !" NEXT GOSUB10085
9210 FORA=0TO3000 NEXT L=L+1000 S=0 W=1.9
     POKE53280,6 POKE53281,6 GOTO30
9500 REM # BOARD 1 #
9501 PRINT"
9502 PRINT"
9503 FORN=0TO4 PRINT"                        " NEXT
9510 N=1024 M=55296
9520 POKEN+70,81 POKEM+70,0
9521 POKEN+90,81 POKEM+90,0
9522 POKEN+102,81 POKEM+102,0
9523 POKEN+152,81 POKEM+152,0
9524 POKEN+212,81 POKEM+212,0
9525 POKEN+305,81 POKEM+305,0
9526 POKEN+415,81 POKEM+415,0
9527 POKEN+430,81 POKEM+430,0
9528 POKEN+400,81 POKEM+400,0
9529 POKEN+232,81 POKEM+232,0
9530 POKEN+515,81 POKEM+515,0
9531 POKEN+625,81 POKEM+625,0
9532 POKEN+605,81 POKEM+605,0
9533 POKEN+507,81 POKEM+507,0
9534 POKEN+330,81 POKEM+330,0
9535 POKEN+607,81 POKEM+607,0
9536 POKEN+657,81 POKEM+657,0
9537 POKEN+580,81 POKEM+580,0
9538 POKEN+581,81 POKEM+581,0
9539 POKEN+499,81 POKEM+499,0
9540 POKEN+312,81 POKEM+312,0
9541 POKEN+550,81 POKEM+550,0
9599 RETURN
9600 REM # BOARD 2 #
9601 PRINT"
9602 POKE646,13
9603 PRINT"
9604 FORN=0TO4 PRINT"
9605 N=1024 M=55296 FORA=220TO420STEP80
9610 POKEN+A,81 POKEM+A,0 NEXT
9650 RETURN
9700 REM # BOARD 3 #
9710 PRINT"
9711 PRINTTAB(28),"" PRINTTAB(28)""
9715 FORA=0TO2 PRINTTAB(28)"" NEXT
9720 RETURN
9800 PRINT"J" PRINT"" POKEV+39,6
9805 POKE53280,6 POKE53281,6 POKE646,1 POKEV+21,0
9810 PRINT"        YOU MIST THE AIR CURRENT"
9811 PRINT PRINT"        YOU TRAVELLED"L"MILES"
9820 FORA=0TO3000 NEXT GOTO9900
9850 PRINT"J" PRINT""
9851 POKE53280,6 POKE53281,6 POKE646,1 POKEV+21,0
9855 PRINT"        YOU BURST THE BALLOON"
9856 PRINT PRINT"        YOU TRAVELLED"L"MILES"
9860 FORA=0TO3000 NEXT GOTO9900
9900 REM #START#
9901 RESTORE
9902 S=0
9903 TI$="000000" W=1.7
9904 POKEV+40,0
9905 PRINT"J"
9906 IFL>HTHENH=L
9907 L=0
9910 POKE53281,0 POKE53280,0 POKE646,6
9915 POKEV+21,0 PRINT PRINT
9917 PRINT"
9920 PRINT"
9922 PRINT"
9924 PRINT"
9926 PRINT"
9928 PRINT"
9929 PRINT PRINTTAB(15)"FROM"
9930 PRINT PRINTTAB(18)"THE"
9935 PRINT PRINTTAB(14)"
9936 PRINTTAB(14)"
9938 PRINTTAB(14)"
9940 PRINTTAB(14)"
9942 PRINTTAB(14)"
9943 PRINTTAB(14)"
9944 POKE646,1
9945 PRINT PRINTTAB(30)"BY" PRINTTAB(32)"S.MYLER"
9947 PRINT"              PRESS F1 TO START"
9950 IFTI$="000010"THENGOTO10093
9970 GETA$ IFA$=""THENGOTO10
9995 GOTO9950
10000 REM # BURST #
10010 POKE54296,15 POKE54277,255 POKE54278,255
      FORA=60TO0STEP-1
10015 POKE54273,A POKE54272,A
10020 POKE54276,129 NEXT
10030 POKE54276,0 POKE54277,0 POKE54278,0
10040 RETURN
10050 POKE54296,15 POKE54277,127 POKE54278,127
      FORA=60TO0STEP-1
10055 POKE54273,A POKE54272,A
10060 POKE54276,129 NEXT
10070 POKE54276,0 POKE54277,0 POKE54278,0
10080 RETURN
10085 POKE54296,15 POKE54277,127 POKE54278,127
      FORA=0TO100
10086 POKE54273,A POKE54272,A
10087 POKE54276,17 NEXT
10089 POKE54276,0 POKE54277,0 POKE54278,0
10090 RETURN
10093 PRINT"J"
10095 POKE53280,6 POKE53281,6 V=53248 POKEV+39,7
10100 GOSUB9500 FORA=0TO3000 NEXT
10101 GOSUB9600 FORA=0TO3000 NEXT
10110 GOSUB9700 FORA=0TO3000 NEXT PRINT"J" GOSUB9100
      FORA=0TO3000 NEXT
10120 GOTO9900
```

Perchance to dream

Well, folks, here it is at last! If you've been following *PCW* for the last few weeks you should now have two clues to help you solve this mini adventure from Star Dreams.

The first five correct answers will win a copy of the fantastic new adventure *The Sandman Cometh* (in two 48K parts) plus the outright winner will also get a bottle of vintage champagne! Ten runners up will receive copies of Star Dreams' *ZX Toolkit* programming aid for the 16/48K Spectrum.

When you've typed in the listing, here are the instructions: The game is a cross between an adventure and a quiz. You will wander round a fairground, and you may enter each sideshow or ride. If you do you will be asked a question which you may reject as a red herring, or you may choose to answer. There are ten locations and seven of the questions are genuine. After seven questions have been answered, you will hear seven notes of a tune. To win you must send the song title to *PCW*.

The questions must be answered in the correct order and this correct order can only be deduced from one of the two previously published clues. (The other clue refers to the song title.)

Direction commands are *N, E, S* & *W* and you can see all your options if you type in *Vocab*. Making a map would be useful.

The best of luck!

```
 832 PRINT : PRINT "Press the n
umber of your choice."
 833 RESTORE 833: DATA 127,82,4
9,57,86,32,32,83,84,65,82,32,68
,82,69,65,77,83: DIM U$(18): FO
R N=1 TO 18: READ Q: LET U$(N)=
CHR$ Q: NEXT N: PRINT #0;AT 1,0
;U$
 835 IF INKEY$="1" THEN  RUN
 836 IF INKEY$="2" THEN  STOP
 837 IF INKEY$="3" THEN  RANDOM
IZE USR 0
 838 GO TO 835
1000 DATA "What is the worlds f
astest fish?","1:Marlin","2:Sha
rk","3:Flying Fish","4:Salmon",
"5:Minnow",11,25,22,23,31
1100 DATA "Which of the followi
ng actors  has never played DR
ACULA in a  film?","1:Bella Lu
gosi","2:Max Schreck","3:Boris
Karloff","4:Christopher Lee","5
:Klaus Kinski",21,13,24,27,32
1200 DATA "What was the name of
 the cow in the childrens TV se
ries MAGIC  ROUNDABOUT?","1:An
nabel","2:Florence","3:Brian",
4:Buttercup","5:Ermintrude",14,
27,35,14,23
1300 DATA "Johann Strauss the A
ustrian    WALTZ KING was born
 in which    year?","1:1785","2
:1801","3:1825","4:1840","5:180
0",14,22,24,14,34
1400 DATA "Which constellation
is often    referred to as THE
BIG DIPPER?","1:Ursa Minor","2:
Lyra","3:Ursa Major","4:Crux",
5:Orion",26,21,19,36,15
1500 DATA "Which group made the
 album GHOST IN THE MACHINE","1:
Iron Maiden","2:The Stranglers"
,"3:Bobby (BORIS) Picket","4:Th
e Police","5:Spirit",25,31,23,1
2,24
1600 DATA "Which card in the MA
JOR ARCANA  TAROT does not have
 a number?","1:The Wheal of For
tune","2:The Lovers","3:The Han
ged Man","4:The Fool","5:Death"
,22,31,34,11,32
1700 DATA "What was the name of
 the gun    specially made for
WYATT EARP?","1:Buntline Specia
l","2:Frontier Special","3:Winc
hester Yellow Boy","4:Remington
 Tombstone Special","5:Walther
PPK",21,23,28,26,32
1800 DATA "Which planet has GAN
YMEDE as oneof its moons?","1:M
ercury","2:Mars","3:Saturn","4:
Jupiter","5:Uranus",22,17,32,23
,35
1900 DATA "How often is the clo
ck on THE   FIRE OF LONDON MONU
MENT's face  wound up?","1:Once
 per Day","2:Once per Week","3:
Once per Fortnight","4:Once per
 Month","5:Once per Year",15,17
,23,34,31
2000 CLS : PRINT "YOUR QUESTION
IS:": RESTORE A(X,Y): READ Q$:
PRINT Q$: PRINT : FOR N=1 TO 5
: READ Q$: PRINT Q$: NEXT N
2010 DIM M(5): FOR N=1 TO 5: RE
AD Q: LET M(N)=Q: NEXT N
2020 PRINT : PRINT : PRINT "PRE
SS A to answer.
    E to exit."
2030 IF INKEY$<>"" THEN  GO TO
2030
2040 IF INKEY$="A" OR INKEY$="a
" THEN  GO TO 2100
2050 IF INKEY$="E" OR INKEY$="e
" THEN  GO TO 100
2055 GO TO 2040
2100 FOR N=10 TO 17: PRINT AT N
,0;Q$(,0): NEXT N: LET CT=CT+1
  10 DATA .0,.8,.4,.6,.2,.4,.8:
 DIM T(7): FOR N=1 TO 7: READ Q
: LET T(N)=Q: NEXT N
  20 DIM B(7): LET CT=0: DIM Q$
(32): FOR N=1 TO 32: LET Q$(N)=
CHR$ 32: NEXT N: LET X=1: LET Y
=X: DIM A(5,2): LET Q=1000: FOR
 B=1 TO 5: FOR N=1 TO 2: LET A(
B,N)=Q: LET Q=Q+100: NEXT N: NE
XT B
  22 DATA "N (North)","S (South
)","E (East)","W (West)","ENTER
","VOCABULARY","PLAY","QUIT
  50 DATA "Dodgems","House of D
racula","Merry-Go-Round","Waltz
er","Roller Coaster","Ghost Tra
in","Fortune Teller's Tent","Sh
ooting Gallery","Space Ride","C
lockwork Toy Exhibition"
  52 RESTORE 50: DIM B$(5,2,25)
: FOR B=1 TO 5: FOR N=1 TO 2: R
EAD Q$: LET B$(B,N)=Q$: NEXT N:
 NEXT B
 100 GO SUB 650
 105 POKE 23658,8: INPUT "What
now?                          "; L
INE U$: IF LEN U$<1 THEN  GO TO
 100
 110 IF LEN U$=1 THEN  GO TO 50
0
 111 IF LEN U$<3 THEN  GO TO 19
0
 112 IF U$(1 TO 3)="ENT" THEN
GO TO 2000
 114 IF U$(1 TO 3)="OUT" THEN
GO TO 100
 116 IF U$(1 TO 3)="VOC" THEN
GO TO 800
 118 IF U$(1 TO 3)="QUI" THEN
GO TO 830
 120 IF U$(1 TO 3)="PLA" THEN
GO TO 550
 190 PRINT #0;AT 1,0;"I don't u
nderstand": BEEP .5,-5: FOR q=1
 TO 150: NEXT q: GO TO 100
 500 REM
 505 LET OX=X: LET OY=Y
 510 IF U$="N" THEN  LET X=X+1:
 GO TO 520
 512 IF U$="S" THEN  LET X=X-1:
 GO TO 520
 514 IF U$="E" THEN  LET Y=Y+1:
 GO TO 520
 516 IF U$="W" THEN  LET Y=Y-1:
 GO TO 520
 518 GO TO 190
 520 IF X>5 OR X<1 THEN  LET X=
OX: GO TO 600
 522 IF Y>2 OR Y<1 THEN  LET Y=
OY: GO TO 600
 530 GO TO 100
 550 FOR N=1 TO CT: BEEP T(N),B
(N): NEXT N: GO TO 100
 600 PRINT #0;AT 1,0;"Sorry,you
can't go that way!": BEEP .5,-
5: FOR q=1 TO 150: NEXT q: GO T
O 105
 650 CLS
 670 PRINT "You are at the entr
ance to     The ";B$(X,Y)
 690 RETURN
 800 RESTORE 22
 810 PRINT AT 3,0;"Your legal c
ommands are:": FOR n=1 TO 8: RE
AD Z$: PRINT  BRIGHT 1;Z$: NEXT
 n: BEEP .2,20: GO TO 105
 830 CLS : PRINT "Your options
are:": PRINT "1:RESTART GAME":
PRINT "2:STOP": PRINT "3:ERASE
PROGRAM"
2110 INPUT "YOUR ANSWER? (1 to
5) "; LINE U$: IF LEN U$<>1 THE
N  GO TO 2110
2115 IF U$<"1" OR U$>"5" THEN
GO TO 2110
2120 LET U=VAL U$: LET B(CT)=M(
U): IF CT=7 THEN  GO TO 3000
2130 BEEP .2,B(CT)
2150 GO TO 100
3000 CLS : PRINT "YOU HAVE ANSW
ERED SEVEN OF THE  QUESTIONS.DO
 YOU NOW RECOGNISE  THE FOLLOWI
NG TUNE?": PRINT : PRINT "Press
 Z to hear it."
3005 IF INKEY$<>"Z" AND INKEY$<
>"z" THEN  GO TO 3005
3010 FOR N=1 TO CT: BEEP T(N),B
(N): NEXT N
3020 PRINT AT 4,0;"C to hear ag
ain.                 O for optio
ns."
3030 IF INKEY$<>"" THEN  GO TO
3030
3040 IF INKEY$="C" OR INKEY$="c
" THEN  GO TO 3010
3045 IF INKEY$="O" OR INKEY$="o
" THEN  GO TO 830
3050 GO TO 3040
```



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Elevated

Program *Hampstead* **Micro** Commodore 64 **Price** £2.95 **Supplier** Melbourne House, Castle House, Castle Yard, Richmond, Surrey

Fancy a change from killing the troll/dragon/giant and finding endless heaps of treasure? What you need is a nice trip to *Hampstead*.

The software house which brought you *The Hobbit* and *Sherlock* has now demonstrated that you don't have to have graphics or even a complex instruction format if the game is funny, original and fast moving enough. This little package should have enough of all three qualities for most people and even managed to win me over despite its male chauvinist overtones and a simple verb/noun command structure.

The object of the game is, simply, to become a Hampstead Man, a squash-playing, Guardian-reading person of means and position who when not at home with wife Pippa and three lovely children, is more than likely to be jogging on the Heath whilst listening to Verdi on the Sony Walkman.

Sounds simple? Aha, but to get there you have to rise from the lowest form of social life through a combination of animal cunning, social climbing and sheer conmanship. Attaining Hampstead means leaving your dingy and disgusting flat (in the wrong part of town) behind you for ever and moving through a series of increasingly elevated circles by whatever means come to hand to the Promised Land.

First explore your horrible flat thoroughly (on second thoughts, avoid the bathroom) before leaving as you cannot get back in. There are clues in the extremely witty accompanying booklet, which together with the program manages to libel comprehensively the whole of London's NW6 postal area.

```
You are in your bathroom.
A cracked washbasin contains the remains
of last night's Chicken Vindaloo and
chips....
Not a pretty sight!
LOOK
I see nothing special.
```

Don't forget that in *Hampstead* appearance is all, so make sure you're always dressed to fit in with your surroundings, whether they be the dole office or a top City boardroom. You'll need to know all the morally correct attitudes for the sake of conversation, but try *Acting* on them and you'll be damn lucky to attain Kilburn!

Barbara Conway

Invaluable

Software *Vu-Calc* **Price** £1.25 **Micro** ZX81 **Supplier** Sinclair/Retail

At the give-away price of £1.25, *Vu-Calc* for the ZX81 must be about the best value on the market. Indeed, it might be even worth buying one of Uncle Clive's little black boxes, just for this program. Basically, *Vu-Calc* does for a matrix or table of numbers what the pocket calculator does for a single number.

An ideal means of keeping household accounts, the program enables you to store words and numbers in a table made up of 26 rows and 36 columns. Each of the 936 pigeon-holes can be connected by arithmetic formulae using the operations ×, +, /, and −.

Of course, it is not possible to display all of the data at once. By using the cursor to move around the table, different 9-row by 3-columns can be displayed and copied to a printer if required.

Besides being suitable for domestic book-keeping, *Vu-Calc* can prove invaluable to the small businessman. Not only would it be possible, for instance, to quickly recalculate the price list and attendant VAT payments at the time of a 20% sale reduction — with the minimum of effort it would also be possible to recalculate the value of stock. As well as carrying out financial analyses and producing budget sheets, *Vu-Calc* enables the businessman to experiment — to explore the effect on profits of changes in key prices. For small scale uses this *Vu-Calc* is just as effective as its famous cousins, which cost many times more.

Tane Hussey

Antiquity

Program *Terra Force* **Micro** Spectrum 16K **Price** £2.49 **Supplier** Firebird Software, Wellington House, Upper St Martin's Lane, London WC2H 9DL

Firebird is the brand name of British Telecom's software wing (geddit?) but on this showing, flaming Firebird is about as dynamic as that cold turkey, Buzby.

When they could have produced a truly original game, based on B.T. experience (eg, find a public call box that's empty, hasn't been used as a toilet, actually works, etc.) they've served up that old favourite, *Centipede*.

Not that the inlay note indicates this — Terra Man must defend his home planet and the Moon against Ygothulu the planet devourer and his marauding hordes of Demon Bombers and Solar Pods.' The Solar Pods move in chain formation, zig zagging down the screen, the Demon Bombers bomb you (what else?) and you shoot them all.

B.T. wouldn't claim they were offering the latest in communications then sell you two tins and a length of string, would they, so why disguise this arcade antiquity?

However, it is a fair version of the game with some attractive graphics and the cost is reasonable, though you shouldn't pay more than bargain price for such outdated programs.

It's not desperately fast, and I suspect there's a fair amount of Basic in it, but if you want a *Centipede* variation, it's acceptable.

John Minson

Credible

Program *Starstrike* **Micro** Spectrum 48K **Price** £5.95 **Supplier** Realtime Software, Prospect House, 32 Sovereign Street, Leeds LS1 4BJ

Realtime has already produced a near perfect *Battlezone* game in *Tank Duel*, now they've done the same for *Star Wars*. Your mission is to shoot out reactor cubes having flown to the planet, across its surface and along a trench. Your reward is a view of the planet exploding then hyperspace and the next mission where it all happens again — only faster!

Starstrike is not only impressive because of its wireframe 3D graphics though they're so smooth and credible that flying your starfighter is genuinely invigorating: it's also highly playable, with a beginners' level simple enough to give anybody a fair chance, after which you'll be hooked.

A minor complaint is the lack of high score table, but this game actually started my adrenalin flowing, and for that I'll forgive it almost anything. Right, that's the review written — can I have another go now?

John Minson

Limited

Program *Family Quiz* **Micro** BBC B **Price** £12.95 **Supplier** Blandford Press, Link House, West Street, Poole, Dorset.

What is a Bundan's Ass? No, I didn't know either. It's an example of a general knowledge question from the quiz book edited by Elizabeth Young and included in the *Family Quiz* package. At £1.80 the book's 1300 questions and answers offer good value for money, plenty of fun and a chance to learn intriguing facts. But why, oh why, did they ever try to make it into a computer package?

Damian Richardson's computer version presents a menu for selection of categories and number of questions per round. Then it offers a random set of questions in the appropriate category and waits for your answer. What it cannot do is tell if you are right!

A human inquisitor can interpret human answers, allow for variant spellings and accept descriptions that do not follow the standard answer word for word. This program cannot. It has very limited powers of discretion. It refuses 'GREY' for 'GRAY' but accepts some plurals. It will extract its ideal answer words from a longer phrase but with weird results. For *What is two and two*, the answer *Two and two is not four* would be accepted!

If the program thinks you got it wrong it tells you its answer. At the end of each round it tells you your score.

Bundan's Ass is an indecisive man. I'm not — I do not recommend anyone to pay £11.45 for this program!

Dave Watterson

Shop floor

Program *Trouble in Store* **Micro** Oric 1/Atmos **Price** £8.95 **Supplier** Orpheus Ltd. The Smithy, Unit 1, Church Farm, Hatley St George, Nr Sandy, Beds. SG19 3HP

This innovative arcade game is set in a fictional department store, "Harridges". The player controls the store manager who must hop from ledge to ledge with the object of collecting the key to empty the till, thus moving on to the next department. But the store's weird collection of goods has become animated and so must be avoided.

Only three keys are used. They move the manager left and right and enable him to leap onto a platform to avoid the manic merchandise.

Trouble in Store has smoothly moving sprite graphics, a continuous musical accompaniment (which can be turned off), and an intriguing surprise. Listen to the burst of noise that heralds the start of a game and with just a little imagination you will hear your Oric speak!

This state-of-the-art program demonstrates that Oric/Atmos software can equal the best that is available for other, more popular micros.

Vic Fielder

Irritating

Program *Plan and Design your Garden* **Price** £14.95 **Micro** Spectrum **Supplier** Blandford Press, Link House, West Street, Poole, Dorset.

As far as I am aware, there is no other program to help you plan your garden, that fact and a pretty box may get this program far more attention than it deserves.

My copy didn't even have a booklet or explanatory leaflet, giving loading and user instructions (the vague blurb on the back of the box didn't count at all): this was particularly irritating when typing in details for the 'diary' section.

One would expect from a program purporting to 'Plan and Design your Garden' that certain questions would be asked, like the size of the garden, soil type and the amount of light it got — but no. All you are given is a blank TV screen and primitive etch-a-sketch drawing facilities that are an insult to current graphic achievements on the machine. The program was slow to respond to key presses and the information stored in the data base of the *Diary* grossly inadequate.

The book itself, at £3.95, would make a useful and entertaining stocking filler, but the book and program at £14.95 — forget it!

Lolita Taylor

Misspelt

Program *Holy Horrors* **Micro** BBC B **Price** £6.95 **Supplier** Romik Software Limited, 272 Argyll Avenue, Slough, Berks.

Graphics are still rare in Beeb adventure games so Clive Webster's new work is welcome. Despite the blurb it is a conventional adventure, though one with an interesting story background. Unfortunately it has faults.

There are some things no program should do: make horrendous spelling errors in the opening lines; fail to give instructions on screen or in the packaging; omit a *Save* routine, leave your micro in such a mess you have to switch off to restore order. *Holy Horrors* is guilty of them all.

The background story suggests that humble peasants were known as surfs (either by analogy with Smurfs or in tribute to washing powder). After a snazzy 'Good Luck' message the screen waits .. and waits without asking you to touch a key to continue. When a picture has been drawn a couple of lines of text appear below it. Your next key press banishes the image, moves the text to the top of the screen and sometimes adds extra information.

As for the lack of *Save* routine — that just means I'm not likely to play an adventure again unless it is really gripping. The need to switch off to restore the Beeb's default state is like a hangover from Spectrum days.

All in all these faults are annoying and the game is just not good enough to compensate for them.

Dave Watterson

Pitched

Program *Sound Generator* **Micro** Spectrum 48K **Price** £5.95 **Supplier** Park Gate Publishers, 24 London Road, Apsley, Hemel Hempstead, Herts

Why is the Spectrum like a good Victorian child? Because it is often seen but not heard.

Sadly, the only way to annoy the neighbours with the constant thump of *Space Invaders* biting the moon dust is to use a hardware peripheral, but there are ways to liven up the rather mundane 'Beep' with software utilities such as this.

Sound Generator presents nine parameters, from starting the sound with a fraction of the Spectrum's click cycle, to four pitch controls which shape it. These are easily altered using the keyboard top row. One great advantage of the system is that you can hear the sound at any stage of creation, and revise it if desired.

Once satisfied you can move on to the next sound — the program has room for 29 — or save it to tape, to be loaded as a block of code and recalled when desired. As the data occupies the print buffer this could limit its use in some programs.

In its favour, *Sound Generator* uses interrupts, meaning that other action is not visibly slowed by its operation. The instructions are sufficient though a little more information would have been useful, even so the program is friendly and is great fun to experiment with. If you need such a utility I can recommend it.

John Minson

Favourites

Program *Select 1* **Price** £12.49 **Micro** Commodore 64 **Supplier** Computer Records, 21 Napier Place, London W14 8LG

Select 1 is an interesting innovation in computer game. It contains no fewer than 12 games, all of which first appeared some time ago at full price (£6 to £9). This collection is available at only £12.49, and so it represents a considerable saving over the original price for the games.

The games were first published by four different software houses and they include a number of old arcade favourites and a couple of adventures. Firstly, the adventures — *Ring of Power* is a fairly routine fantasy adventure, but *Denis through the Drinking Glass* is unusual and entertaining. You take the role of Denis Thatcher striving to escape the political jungle. On your way you meet a number of famous figures, like Ken Livingstone, Mary Whitehouse, the Pope, etc, but you must avoid Maggie at all costs, or else you will have to listen to her latest speech.

The arcade games are a mixed bunch — some good, some indifferent. *Hexpert*, *Purple Turtles*, *Cosmic Commando* and *Star Base Defence* are all perfectly competent, but unexciting games. However, *Moon Buggy* is a good version of the popular arcade game. Likewise, both *Scrabble* and *Kong* are good arcade derivatives and they should appeal to fans of the originals. The remaining three games are all very good — *Galaxy* is an excellent version of the early arcade hit *Galaxians*, and *Mr Wimpy* and *Hunchback* are both very enjoyable and well written games.

Although the standard of the games is a bit variable, the cassette is still very good value at just over £1 per game. There are several very enjoyable games on it, not perhaps quite as sophisticated as some of the more recent releases but good fun all the same.

Richard Corfield

Wild West

Program *California Gold Rush* **Price** £2.99 **Micro** Commodore 64 **Supplier** Software Projects, Bear Brand Complex, Allerton Road, Liverpool.

It is surprising to come across a new game for the 64 as basic as *California Gold Rush*. It is essentially a very simple grid type of game — you know the one where you score points by enclosing rectangular areas by moving all around the edge of them. In this game, the setting is a gold mine and the grid is made up of the tunnels in the mine. For every block of tunnels you walk round, you collect a number of bags of gold corresponding to the area enclosed. However, since the setting is the Wild West, there are a couple of Indians after you. Contact with them is fatal, and as the game progresses more Indians appear, and they start to shoot arrows at you just to make things a bit more exciting. Once you have completed one screen, another slightly different one appears and you start all over again.

This is really not a very interesting or exciting game. The play is quite straightforward and lacks variety. As a result it soon becomes repetitive. The graphics and sound are OK, but they are also pretty simple, and they are not lively enough to lift the game above the ordinary. But £2.99 is hardly a rip off though.

Richard Corfield

Better late than never

The Enterprise computer has finally been assembled in one piece. Andrew Pennell takes it apart again

Stardate 0301-1985 this is Captain Kirk reporting the landing of the Enterprise, around 12 months late. Has anything happened while I've been away

The micro with the longest running delivery delay saga has finally been released to the world. It was originally shown at the 1983 *Personal Computer World* show, scheduled for release in early 1984.

After numerous promised delivery dates, price rises, a laughable number of name changes and a similar 'Rom overflow' problem to the QL, the machine has finally appeared, called the Enterprise 64, costing £249.95.

The question is is it worth the wait?

The Enterprise comes in a dark grey case, most of the keys being similarly coloured, except for the blue function keys, green editing keys, and a red stop key These combinations, combined with the seemingly squashed front of the case give the machine a rather cheap appearance To the right of the keyboard is a joystick, which replaces the cursor keys of other machines, and above the function keys is a hinged plastic cover, under which strips of paper can be placed to label the keys. On the left of the machine is the Rom slot, and along the back are connections for the TV, a monitor, cassette sockets, a serial/network port, a parallel printer port, and two joystick sockets. While this is a good selection, there is a snag — with the exception of the TV and cassette sockets, the others are all totally non-standard The cost of proper sockets was obviously too much, so they are all just edge connectors extended on the edge of the PCB, Spectrum-style (none of them have a proper polarising slot either, so any plugs can be put in upside down, with potentially disastrous results. You will have to wait until Enterprise release their forthcoming adaptor leads until you can connect your monitor, printer, etc)

Although there is no on/off switch, it does have a *Reset* switch on the back. When pressed once, it gives what is called a warm start — so you don't lose your program, but if pressed twice it will completely reset. On the right is the expansion port, with a loose plastic cover, into which any add-ons will plug.

An important feature of any micro is the keyboard, but unfortunately the Enterprise one is quite awful. It looks as if its going to feel good, but as soon as you touch it you realise it isn't. Inside it uses a membrane very similar to the QL keyboard, which itself has been universally disliked. Somehow, though, the Enterprise one is actually worse than the QL's — indeed, it is the worst keyboard I have ever used since the launch of the Spectrum. In case I was wrong, I took it to my local computer club, and everyone seemed to agree with me — ugh! It is possible to produce a good keyboard with membrane technology as my Apple add-on proves, but Enterprise do not seem to know how

Inside the machine is a new PCB containing much of what you would expect, the processor Z80, some Ram, and a lot of TTL chips. The most interesting components on the board are two custom chips, little flat square devices with an awful lot of pins. One is labelled 'Dave', and is responsible for sound generation and memory decoding, while the other is 'Nick', and covered with a large copper heatsink. These custom chips are responsible for most of the Enterprises features — and most of the delivery delays too.

When writing the Rom for the Enterprise, the 'QL phenomenon' occurred — the 32K allocated for the operating system and Basic proved to be not enough, so it was decided to use a plug-in external Rom cartridge, within which the Basic lies

Within the machine is a 32K Rom containing the operating system, known as EXOS. Unlike the QL 'dongle', the Enterprise one is a permanent feature, in a neat box, and which plugs into the Rom slot. When you get another language, you simply unplug Basic, and plug in, say, Lisp If you power up with Basic disconnected, you enter the word processor within the operating system. The standard machine has 64K Ram, but there will be another model with 128K Ram apparently some time in the future No bets on when, though.

The word processor is not *Wordstar*, or even QL *Quill* for that matter, but it does work and is relatively fast. It has the advantage — which the QL's *Quill* does not — of being permanently resident on Rom. The trade-off is that it is pretty crude, with the barest of features — notable missing features are *Search*, and any block move/delete control. The major problem with it is its print-out option. If you enter your text in 40 column mode which is likely as few televisions can cope clearly with 80 columns, you can only print it out in 40 columns, regardless of your printer's width. You also can't send any control codes at all to your printer The printer lead I was supplied with was hand-built, and rather Heath Robinson in construction. It was also very difficult to plug in, but hopefully these features will all be absent on production printer leads, when available.

The Basic on the Enterprise is generally excellent with the all too common exception of the speed with which it runs. Ignoring this, I think it is the best Basic on any home micro, including those found on the Beeb and the QL. It offers very nice 'structured' features, syntax checking and is easily extended with machine code

Basics are becoming more and more like Pascal with every new machine (MSX excepted), though no micro yet offers Apple's MacBasic option of making line numbers entirely optional, though the structured Basics mentioned all could in theory It has *If/Then/Else, Do/While, Do/Until*, long function definitions and procedures (though they are treated as functions with no parameters), and a *Case* statement. It is also the only Basic I know of to support parameters passing by reference and not just value — this will please 'real' programmers used to other (supposedly) superior languages Lines are entered with a neat screen editor using the joystick to move the cursor about, and as this editor is in the Rom then most other languages will also use it, and all lines are syntax checked on entry A suitable error message is given if it is incorrect, then the joystick can be used to move the cursor back up the screen to correct it. As with other syntax-checking Basics, it's rather fussy about where you put the spaces within the lines, but a very nice feature is that is automatically indents lines within *For* and *Do* loops — again this is in MacBasic, but a first on a home micro It not only makes listings far more legible, but shows up programming errors too

Probably the most important feature of the Enterprise is its graphics abilities; Basic supports much of the machine's potential. After a power-up, there is around 50K available, but this decreases depending on which graphics mode is in use

Basic supports a bewildering array of modes, not very well explained in the manual. Normally, you are in 40 column text mode but there is an 80 column mode that takes an extra 18K of memory The other graphics modes divide into two sections — Lo-res and Hi-res There are four sub modes in these, and they determine the number of colours available, trading off with horizontal resolution.

In all modes, there are 180 pixels vertically: in 2 colour mode, there are 640 pixels across; in 4 colour mode there are 320 pixels across; in 16 colour mode there are 160 pixels, and in 256 colour mode there are only 80 pixels. These modes take up around 14K.

The Lo-res modes are similar, but taking up around 8K by halving the horizontal resolution. There is also an 'attribute' mode, giving a Spectrum-like screen. Any of the displayed colours can be chosen from the full palette of 256 colours using either straight numbers or a useful RGB function. The palette is hardware controlled, allowing instant animation when changing colours. There are numerous plotting options, including ellipses, circles, and filling areas, and all work pretty





fast, though, as on the QL, text output to the high resolution screen is rather slow. Other graphics modes can be generated using the custom chip, including mixing of screen modes a la Atari, though they are not directly accessable from Basic. Included on the demo tape is a routine that turns the screen into a 640 by 320 display, of 80 by 50 rows of characters, though it uses up 40K of memory in doing so.

The sound chip — 'Dave' — is an equal to the current leader in the field, the Commodore 64, though my particular machine had an intermittent problem in this area. It has four sound channels with an eight octave range, white noise, high and low pass filtering and ring indulation. Basic supports it well, though full use of it can only be made via machine code.

The theme of the Enterprise is 'obsolescence built out', referring to the expandability of the machine. Although the Z80 can only normally address up to 64K, the Enterprise has a paging mechanism that allows up to 4 megabytes of Ram to be added (much like the way the XP system works on the Spectrum).

However, unlike the 68008 in the QL, it cannot be accessed directly, which has three consequences — the operating system is more complex, programs run slower as they have to page Ram in to read it, and languages have to be extensively modified to allow proper use of the extra memory. EXOS allows for this, and also for external Roms to and languages — BBC style, devices (such as disc drives) and Basic extensions — QL style.

A 128K version of the Enterprise machine should be available next year, along with Ram packs and disc drives, but judging by past performance I approach Enterprise's delivery dates with more scepticism even than Sinclair's.

At present the 64K version is only available in very limited quantities, but should be around in volume by February.

At £249.95 the machine is not as good value for money as it would have been if it had been on time (and £199, as originally intended). Now it must compete with the Amstrad, QL and MSX clones. Nevertheless, it does have advantages. It can access more memory than any of them (though is not as easily accessable as on the QL). It also has superior graphics, and an excellent Basic.

Disadvantages are its terrible keyboard, and difficult connectors.

As with all new machines, there is a dearth of software, but this will apparently be cured in the short term by IS Software.

The biggest problem for the machine, though, will be getting over the credibility problems created by the machine's late arrival and its identity crises last year which resulted in the machine being the Samurai, then the Elan, then the Flan, then the Enterprise.

Selective changes

*A treat for Vic 20 machine code programmers — Bit Change Studies with M/C Operators by **Chris Cattanach***

This program, written for the unexpanded Vic 20 allows one to experiment in a mixed Basic/Machine Code program, with some of the less well understood mnemonic code terms. *Shift* left and *Rotate* right or ... No! Not a new dance, but a useful way of selectively changing the individual bits of a number.

Before entering the program in the Unexpanded Vic 20 (Program One), it is necessary to set aside an area where one can store the machine code, without fear of it being over-run with Basic. This is accomplished by entering *Poke 52, 28* and *Poke 56, 28*, which drops the top of memory from 7679 to 7168. One now has the region from 7168 to 7679 to place the machine code. If the program is to be *Run* on an expanded Vic, a different procedure is called for (for which see later).

Upon *Running* the program, one is invited to give a number of less than 256, which is then printed out in Binary, in a well spaced format, and highlighted to red. The number, which is also shown in decimal, is then poked into a selected address 7191 (7600 on expanded (16K) Vic), ready for loading into the accumulator.

One is then invited to choose the mode of interaction between the given number and another number yet to be supplied. This can be either *'And'* *'Or'* or *'Eor'* (Exclusive Or). If one of these is chosen, the second number is then requested, and upon being *Entered*, is similarly displayed on the screen in binary, immediately under the first number. This number is also poked into an address 7195 (7605 on expanded Vic).

The *Sys* (7168) command, (Sys 4097 for Expanded Vic), then initiates a machine code program where the first number is loaded into the accumulator and interacted in the chosen manner with the second number. The result is stored in the address 7199 (7610 in expanded Vic), and then when the program returns to Basic, it is printed out in binary beneath the first two numbers. One is thus able to discern at once how any of the eight bits has been changed in the relevant byte.

One is also given the choice of observing the effect of acting upon the first number to be loaded into the accumulator, with the instructions *Asl* (shift left one bit), *Lsr* (shift right one bit), *Rol* (rotate bit left), and *Ror* (rotate bit right).

If the program is *Run* on the expanded Vic 20 (16K), a space must again be first reserved for the machine code, safe from the actions of Basic. This is done by *Running* the short Program 2 every time the computer is first switched on. This moves the start of Basic to 8192, and reserves the section from 4096 onwards for machine code. As described in the Commodore Programmers Reference book, the screen address has now been moved to 7680.

Program 2 should be saved for future use, before being *Run*. After being *Run*, it is automatically erased from memory once it has done its job. It is also necessary to change the three machine code storage addresses and two *Sys* commands indicated in the above article. Changes must also be made in the contents of the two *Data* statements at Lines 900 and 905. Table 1 shows the changes to the Listing which must be made when the program is *Run* on the expanded Vic 20.

PROGRAM 1

```
1 REM "BIT CHANGE STUDIES WITH MACHINE CODE OPERATORS"
2 REM BY C.I.CATTANACH
3 FORZ=7168TO7178 READP POKEZ,P NEXT
4 FORZ=7179TO7187 READP POKEZ,P NEXT
5 PRINT"SUPPLY NUMBER FOR ACCUMULATOR"
6 INPUTJ% K%=J% POKE7191,J%
7 GOSUB600
10 PRINTCHR$(147)"ACCUMULATOR" J%
11 PRINT"
13 GOSUB200
25 PRINT"AND 'F1' OR 'F3' EOR 'F5' ASL 'F7' LSR
   'F2' ROL 'F4' ROR 'F6''
26 GETA$ IFA$="" THEN26
27 IFA$="" THENF=1 POKE7172,45 GOTO36
28 IFA$="" THENF=2 POKE7172,13 GOTO36
29 IFA$="" THENF=3 POKE7172 77 GOTO36
30 IFA$="" THENF=4 POKE7183,10 GOTO1000
31 IFA$="" THENF=5 POKE7193,74 GOTO1000
32 IFA$="" THENF=6 POKE7180 42 GOTO1000
33 IFA$="" THENF=7 POKE7193 106 GOTO1000
35 GOTO26
36 PRINT"SECOND NUMBER"
37 INPUTK% POKE7195,K%
38 PRINTCHR$(147)"... ACCUMULATOR
39 PRINT"... GOSUB200
45 IFF=1THENPRINT"AND"
46 IFF=2THENPRINT"OR"
47 IFF=3THENPRINT"EOR"
50 [illegible]
58 [illegible]
61 PRINT"
65 GOSUB200
75 SYS 7168)
82 [illegible]
83 [illegible]
94 PRINT"[illegible]
95 PRINT"... J%
96 PRINT"... GOSUB200
98 GETA$ IFA$="" THEN98
99 GOTO5
200 PRINT"... A%"... B%"... C%"... D%"... E%"... F%"... G%"... H%"
202 RETURN
600 A%=INT(X/128)
602 IFA%=0THENX1=0
603 IFA%=1THENX1=128
604 B%=INT((X-X1)/64)
605 IFB%=0THENX2=0
606 IFB%=1THENX2=64
```

Continued over the page

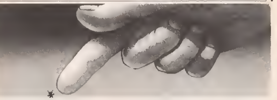
[illegible]

PROGRAM 2 SAVE BEFORE RUNNING

```
2 REM 'CLEAR AREA FOR MACHINE CODE IN
  EXPANDED VIC'
3 [illegible]
4 POKE[illegible] POKE[illegible],[illegible] POKE641,[illegible]
  POKE642 32 POKE36869 240
[illegible] POKE[illegible] POKE44 32
[illegible]
[illegible] NEW
```

TABLE 1

```
1 REM "NEW LINES FOR PROGRAM 1 IN
  EXPANDED VIC'
[illegible] READ[illegible] POKEZ [illegible] NEXT
[illegible] READ[illegible] POKE[illegible] NEXT
[illegible] POKE7600 [illegible]
[illegible] POKE7605 [illegible]
75 [illegible]
[illegible] PEEK [illegible]
900 DATA24 [illegible] 176 29,45 [illegible] 29 141,196,29 96
905 DATA24 173 175 29 10,141,186 29,96
1005 SYS [illegible]
[illegible]
```



A sticky wicket

We can't provide the furry dice, but try Stickers for any BBC
by ***Andrew Heptonstall***

You are bound to have seen car stickers with the phrase 'I love something', the word 'love' being replaced by a heart shape. This program for the BBC model B (model A owners change Line 50 to *Mode 4* and Line 150 to *Mode 5*), will produce a sheetful of such stickers providing you have a screen dump program for your printer. If you don't have sticky paper, you will need to stick it on with 'sticky tape'. You must type in your message (not more than 14 characters) and press *Return*. Alter lines 230 and 240 to the correct commands to operate your particular screen dump program.

Program Notes

Line No	
50	Selects screen mode
60	Calls PROCcharacs.
70-110	Dimensions array and sets up screen.
120-130	Type in message, and check length.
170-220	Prints message and heart on screen seven times.
230-240	Calls up screen dump

Procedures

PROCdouble	Works out how to print writing double normal height
PROCdisplay	Prints double height message.
PROCcharacs	Defines user-defined characters for heart shape

```
10REM.....Hearts.....
20REM.......BY.......
30REM.....Andrew.....
40REM...Heptonstall..
50MODE1
60PROCcharacs
70DIM block 9
80CLS
90PRINT'''
100PRINT"Type in the message, then
   press RETURN"
110PRINT
120INPUT W$
130IF LENW$>14 THEN GOTO 120
140W$=" I     "+W$
150MODE2
160PRINT''
170FORU=4 TO 28 STEP4
180PROCdisplay(W$)
190PRINTTAB(3,U);CHR$228;CHR$229
200PRINTTAB(3,U+1);CHR$226;CHR$227
210PRINT
220NEXT
230VDU2B,1,1,2,0 : REM include comm
   ands for own screen dump program
240CHAIN"EPSON" : REM include comm
   ands for own screen dump program
250END
260DEFPROCdouble(A$)
270?block=ASCA$
280X%=block
290Y%=block DIV 256
300A%=10
310CALL &FFF1
320FORF%=0 TO1
330VDU23,224+F%
340FORG%=0 TO3
350FORH%=0 TO1
360VDUblock?(G%+F%*4+1)
370NEXT
380NEXT
390NEXT
400VDU224,10,8,225,11
410ENDPROC
420DEFPROCdisplay(A$)
430PRINT
440FORI%=1 TOLENA$
450PROCdouble(MID$(A$,I%,1))
460NEXTI%
470ENDPROC
480DEFPROCcharacs
490VDU23,228,60,66,129,128,128,
   128,128,64,64
500VDU23,229,120,132,2,2,2,2,4,4
510VDU23,226,32,32,16,16,8,4,2,1
520VDU23,227,8,8,16,16,32,64,128,0
530ENDPROC
```

I ♥ P.C.W.


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Spectrum

Divided squares

Manipulate the screen in this program by ***Paul Rhodes***

Yet another way of clearing the screen may not seem like a particularly useful piece of programming, but this program is basically an exercise in screen manipulation.

It attempts to reproduce the effect sometimes used in photographs (eg, the recent *Radio Times* competition) where a picture is reduced to a number of squares each coloured evenly with the combined resultant of all the colours previously in that square. The 'block-up' program divides the screen into small squares, then either fills in or blanks out each square, depending on the number of set pixels in the square to start with.

For the *Cls* routine, the program starts with 2*2 pixel squares, then moves up to 4*4 and 8*8 (character-sized) squares. It then works on the attributes for 2*2,4*4 and finally 8*8 blocks of character squares (the attributes are used in their bit form — adding red, green and blue components to give a final colour made up of the most prevalent primaries). After the 8*8 blocks the attributes are cleared (the screen display file is cleared after the single character position routine).

The effect is one of repeatedly lowering the screen resolution. It is most effective on game loading screens, as these show the effects of different colours.

To enter the program, either use an assembler or type in the hex loader provided, using *B264* and *B3FB* as start and finish addresses respectively. Type in the bytes from the listing (without separating spaces) up to eight at a time. Enter the checksums when asked, and if an error is reported, start again at the beginning of the line you have just typed in. Save with. *Save"cls" Code 45668,410*. To run the program, *Randomize Usr 45668*.

```
HEX LOADER
1 [illegible]
2 [illegible]
[illegible]
[illegible]
[illegible] CAPS LOCK ON
[illegible] LINE A$:LET START=[illegible]
15 INPUT "FINISH";LINE A$:LET FINISH=[illegible]
20 FOR A=START TO FINISH STEP 8
25 PRINT FN [illegible]
30 LET C=0
40 INPUT LINE A$:LET A$=A$+" "
50 FOR B=0 TO 7:IF A$(1)=" " THEN INPUT LINE A$:LET A$=A$+[illegible]
60 LET Z=FN [illegible]:POKE A+B,Z:PRINT " ";[illegible]:LET C=C+Z
70 NEXT B:INPUT "CHECKSUM: ";LINE A$:IF FN [illegible]<>C-256*INT (C/256) THEN PRINT "CHECKSUM INCORRECT": GO TO 25
80 PRINT: NEXT A
```

```
HEX FOR BLOCK-UP PROGRAM
APOLOGIES FOR ORG
B264 F3 CD B4 B2 CD DE B2 CD =B0
B26C 02 B3 F8 06 08 76 10 FD =43
B274 CD [illegible] B7 06 05 76 10 FD =48
B27C CD [illegible] B3 21 [illegible] 58 11 [illegible] =9E
B284 [illegible] 01 FF 02 [illegible] [illegible] 5C 77 =F4
B28C ED B0 C9 01 [illegible] [illegible] [illegible] 7E =A6
[illegible] A7 C8 7E 30 01 [illegible] 20 F9 =[illegible]
[illegible]
B2E8 [illegible]
```

```
B264 F3                   [illegible]
[illegible]
B29C 24                   [illegible]
[illegible]
B2A6 C1         370 RESP  [illegible]
B2A7 08         380       EX    AF,AF
B2A8 7C         390       LD    A,H
B2A9 90         400       [illegible]
B2AA 67         410       LD    H,A
B2AB 08         420       EX    AF,AF
B2AC AE         430 MIX 3 XOR   (HL)
B2AD A2         440       AND   D
B2AE AE         450       XOR   (HL)
B2AF 77         460       LD    (HL),A
B2B0 24         470       INC   H
B2B1 10F?       480       DJNZ  MIX [illegible]
B2B3 C9         490       RET
B2B4 [illegible]0040  500 BLIF2 LD    HL,#4[illegible]
B2B7 1102C0     510 BU2L1 LD    DE,[illegible]
B2BA 0604       520       LD    B,[illegible]
B2BC C5         530 BU2L2 PUSH  BC
B2BD 010002     540       LD    BC,#02[illegible]
B2C0 CD[illegible]B2 550 CALL  [illegible]
B2C3 C1         560       POP   BC
B2C4 10F6       570       DJNZ  BU2L2
B2C6 7C         580       LD    A,H
B2C7 D608       590       SUB   8
B2C9 67         600       LD    H,A
B2CA CB3A       610       SRL   D
B2CC CB3A       620       SRL   D
B2CE 0604       630       LD    B,4
```

```
B2B0 20EA     640         JR   NZ,BU2L2
B2D2 2C       650         INC  L
B2D3 20E7     660         JR   NZ,BU2L1
B2D5 7C       670         LD   A,H
B2D6 C608     680         ADD  A,8
B2D8 67       690         LD   H,A
B2D9 FE58     700         CP   #58
B2DB 38DA     710         JR   C,BU2L1
B2DD C9       720         RET
B2DE 210040   730 BLUP5   LD   HL,#4000
B2E1 1120FF   740 BU4L    LD   DE,#FF00
B2E4 CDBFB2   750         CALL BUFTN
B2E7 CDBFB2   760         CALL BUFTN
B2EA 7C       770         LD   A,H
B2EB D608     780         SUB  8
B2ED 67       790         LD   H,A
B2EE 160F     800         LD   D,#F
B2F0 CDBFB2   810         CALL BUFTN
B2F3 CDBFB2   820         CALL BUFTN
B2F6 2C       830         INC  L
B2F7 7C       840         LD   A,H
B2F8 2803     850         JR   Z,BU4R
B2FA D608     860         SUB  8
B2FC 67       870         LD   H,A
B2FD FE58     880 BU4C    CP   #58
B2FF 38E0     890         JR   C,BU4L
B301 C9       900         RET
B302 210040   910 BLUP8   LD   HL,#4000
B305 1120FF   920 BU8L    LD   DE,#FF20
B308 010008   930         LD   BC,#0800
B30B CD92B2   940         CALL BRTE2
B30E 7C       950         LD   A,H
B30F D608     960         SUB  8
B311 67       970         LD   H,A
B312 7E       980         LD   A,(HL)
B313 A7       990         AND  A
B314 2814     1000        JR   Z,NOCCOL
B316 E5       1010        PUSH HL
B317 7C       1020        LD   A,H
B318 0F       1030        RRCA
[illegible]
                          CP   #58
                          JR   C,BU8L
                          RET
                          LD   HL,#58
                          LD   BC,#
                          LD   DE,
                          PUSH BC
                          LD   BC,#00
                          CALL SEPRTN
                          POP  BC
B34E          1380        INC  HL
B34F          1390        INC  HL
              1400        DJNZ B16L2
              1410        ADD  HL,DE
              1420        DEC  C
              1430        LD   B,#10
              1440        JR   NZ,B16L2
B358          1450        RET
B359          1460 BLTIND LD   BC,
B35C D9       1470        EXX
B35D          1480        LD   BC,0
B360 D9       1490        EXX
B361 CD81B3   1500        CALL SEPRTN
B364 2        1510        INC  HL
B365 CD81B3   1520        CALL SEPRTN
B368 CD81B3   1560        CALL SEPRTN
B370 1E02     1570        LD   E,2
B372 CDD8B3   1580        CALL UNBFPR
B375 1E20     1590        LD   E,32
B377 77       1600        LD   (HL),A
B378 23       1610        INC  HL
B379 77       1620        LD   (HL),A
B37A A7       1630        AND  A
B37B ED52     1640        SBC  HL,DE
B37D 77       1650        LD   (HL),A
B37E 2B       1660        DEC  HL
B37F 77       1670        LD   (HL),A
B380 C9       1680        RET
B381 7E       1690 SEPRTN LD   A,(HL)
B382 CB5F     1700        BIT  3,A
B384 2801     1710        JR   Z,NBL1
B386 04       1720        INC  B
B387 CB67     1730 NBL1   BIT  4,A
B389 2801     1740        JR   Z,NBL2
B38B 0C       1750        INC  C
B38C CB6F     1760 NBL2   BIT  5,A
B38E C8       1770        RET  Z
B38F D9       1780        EXX
B390 04       1790        INC  B
B391 D9       1800        EXX
B392 C9       1810        RET
B393 210058   1820 BLUP32 LD   HL,#5800
B396 E5       1830 B32L1  PUSH HL
B397 010000   1840        LD   BC,0
B39A D9       1850        EXX
B39B 010000   1860        LD   BC,0
B39E D9       1870        EXX
B39F 110404   1880        LD   DE,#0404
B3A2 CD81B3   1890 B32L2  CALL SEPRTN
B3A5 23       1900        INC  HL
B3A6 1D       1910        DEC  E
B3A7 20F9     1920        JR   NZ,B32L2
B3A9 3E1C     1930        LD   A,28
B3AB 85       1940        ADD  A,L
B3AC 6F       1950        LD   L,A
B3AD 1E04     1960 B32C1  LD   E,4
B3AF 15       1970        DEC  D
B3B0 20F0     1980        JR   NZ,B32L2
B3B2 1E08     1990        LD   E,8
B3B4 CDD8B3   2000        CALL UNBFPR
B3B7 111C00   2010        LD   DE,28
B3BA E1       2020        POP  HL
B3BB E5       2030        PUSH HL
B3BC 010404   2040        LD   BC,#0404
B3BF 77       2050 B32L3  LD   (HL),A
B3C0 2C       2060        INC  L
B3C1 10FC     2070        DJNZ B32L3
B3C3 0604     2080        LD   B,4
B3C5 0D       2090        DEC  C
B3C6 19       2100        ADD  HL,DE
B3C7 20FA     2110        JR   NZ,B32L3
B3C9 E1       2120        POP  HL
B3CA 1E04     2130        LD   E,4
B3CC 19       2140        ADD  HL,DE
B3CD CB45     2150 B32CL  BIT  0,L
              2160        JR   Z,B32L1
              2170        LD   DE,96
     19       2180        ADD  HL,DE
     7C       2190        LD   A,H
     FE5B     2200        CP   #5B
     38C6     2210        JR   C,B32L1
B3DA          2220        RET
     78       2230 UNBFPR LD   A,B
     BB       2240        CP   E
              2250        JR   C,NOBLUE
              2260        SET  0,D
              2270 NOBLUE LD   A,C
              2280        CP   E
              2290        JR   C,NORED
              2300        SET  1,D
              2310 NORED  EXX
              2320        LD   A,B
     D9       2330        EXX
     BB       2340        CP   E
              2350        JR   C,NOGREN
     CBEA     2360        SET  5,D
              2370 NOGREN LD   A,D
     1600     2380        LD   D,0
     C9       2390        RET
              2400 WAIT
     AF       2410        XOR  A
B3F4 DBFE     2420        IN   A,(#FE)
B3F6 2F       2430        CPL
B3F7 E61F     2440        AND  #1F
B3F9 C0       2450        RET  NZ
B3FA 18F7     2460        JR   WAIT
```

Screen and screen again

Jeff Tope presents a Screen Dump routine for the QL user with a Seikosha GP250X printer

This program (or rather, extended procedure!) produces a copy of the screen to a printer — specifically, in this case, the Seikosha GP250X. However, the program is liberally scattered with Rem statements, so it should not prove too much of a task to convert it for use with others.

You can use this program with *Easel* by *Saving* the screen and *Loading* it from Basic — then dumping it with the procedure

```
100 REMark Copyright Jeff Tope October 1984
110 REMark Screen dump for SEIKOSHA GP250X graphics printer documented to permit
 easy adaption to  other printers
120 DEFine PROCedure JTCOPY
130 LOCal scrstart,rasterstep,rasterlen,scrend,scrlocation,b,power2,pline,ypix,b
yte,ybit,usebyte,byte2,yprint
140 REMark local variables
150 scrstart=131072+128*6+4
160 REMark start of screen + 6 pixels down + 16 pixels across ( 8 pixels = 2 byt
es )
170 rasterstep=128
180 REMark no of bytes in one line (row) of screen
190 rasterlen=118
200 REMark no of bytes which represent 480 pixels across screen
210 BAUD 2400
220 REMark baud rate of RS232 for printer
230 OPEN#4,seric
240 REMark channel 4 opened for output - Note use of 'c' option to linefeed -NOT
E ALSO PRINTER SET TO CR + LF TOGETHER , NOT AS FOR A SPECTRUM specifically dip
switch No 1 set off
250 RECOL 0,0,0,0,7,7,7,7
260 REMark turn screen to black and white - black,blue,red,magenta goto black ,
others goto white you might wish to adjust this but remember program only looks
at RED pixels (MODE 4) or a colour with a RED component also in low res (mode 8)
the blue component is also used - so both red and blue components must be set
270 scrend=scrstart+128*209+rasterlen
280 REMark screen end is 209 lines + No of bytes for each line long -this works
in conjunction with the initialize program (BOOT)
290 FOR scrlocation=scrstart TO scrend STEP rasterstep*8
300 REMark step through screen by rasterstep * No of pixels on printhead
310 DIM b(479)
320 REMark array for holding print data - 480 elements -note dimensioning here a
utomatically resets all elements to zero for next printline
330 power2=1
340 REMark simple counter for setting pixel - initial setting here for whole lin
e
350 FOR pline =0 TO 7
360 REMark count through pixels on printhead
370 FOR ypix=0 TO 119 STEP 2
380 REMark step along line looking only at half of colour (RED in MODE 4 , RED a
nd BLUE in MODE 8 -see Concepts Memory Map)
390 byte=PEEK(scrlocation+pline*128+ypix+1)
400 REMark get byte of memory for 8 pixels in one line
410 ybit=7
420 REMark initialize counter for useing byte to full
430 REPeat usebyte
440 REMark loop for draining byte of information
450 IF ybit<0 OR byte == 0 THEN EXIT usebyte
460 REMark has counter finished or is byte empty of information approx equal use
d in case of numeric error -although non have yet been found
```

```
470 byte2=byte MOD 2
480 REMark get least significant bit of the byte that remains
490 byte=INT(byte/2)
500 REMark remove bit of byte just used and move rest of byte across
510 b( ypix*4 + ybit ) = b ( ypix*4 +  ybit ) + power2*byte2
520 REMark set appropriate information into the b array
530 ybit=ybit-1
540 REMark decrease counter
550 END REPeat usebyte
560 REMark loop until finished with byte
570 END FOR ypix
580 REMark close for loop
590 power2=power2*2
600 REMark double bit setting counter
610 END FOR pline
620 REMark close loop
630 PRINT#4,CHR$(27),'L';CHR$(2),CHR$(27), G',CHR$(1),CHR$(224),
640 REMark initialize printer for 480 bytes of graphics data
650 FOR yprint=0 TO 479 PRINT#4,CHR$(b(yprint)),
660 REMark print that data stored in b array
670 PRINT#4\
680 REMark print command LF to printer
690 END FOR scrlocation
700 REMark close loop
710 PRINT#4,CHR$(27),'L',CHR$(3),\
720 REMark reset printer for text
730 END DEFine procedure_JTCOPY
```

A step backwards

One step beyond just joining the dots — Linear Regression for the CPC464 by ***D Rodwell***

Plot is a program which accepts any reasonable number of x and y co-ordinates from the keyboard and displays them as a high resolution plot on a 300 by 300 pixel grid. The scales can be chosen by the user and modified if so desired.

Once the scales have been confirmed the best-fit straight line is displayed together with its equation. The user is then able to use it to calculate any x or y value. The correlation coefficient is also given and this provides a guide to the fit of the regression line.

Program Notes

Line No	
440	X and Y ranges are scaled to fit the 300 by 300 pixel grid.
470	The pixel position of each given point is calculated.
510-540	Individual points are plotted as a plus sign and two or more coincident points are plotted as an asterisk.
560-660	The X scales are drawn.
670-770	The Y scales are drawn.
780-800	The X and Y axes are drawn.
820-840	Labels and title are printed.
850-860	Sets up text windows to the right of the graph.
870-890	Provides an opportunity to rescale the axes.
910-1060	Calculates and prints the regression equation and correlation on coefficient.
1070-1350	Draws the regression line on the plot.
1370-1580	Enables the user to estimate any X for a given Y or any Y for a given X.

```
10 MODE 2
20 DEFINT I,K,N:DEFSTR F-H
30 PRINT "THIS PROGRAM PRODUCES A PLOT OF X AND Y VALUES"
40 PRINT "INPUT FROM THE KEYBOARD AND FINDS THE BEST-FIT"
50 PRINT "STRAIGHT LINE THROUGH THE GIVEN POINTS"
60 PRINT
70 PRINT "INPUT THE X AND Y CO-ORDINATES
        (SEPARATED BY A COMMA)"
80 PRINT "FOR EACH POINT "
90 PRINT
100 INPUT "HOW MANY POINTS WILL YOU INPUT ";N
110 DIM X(N),Y(N)
120 PRINT
130 FOR I=1 TO N
140 PRINT "X(";I;")",Y(";I;")" ";:INPUT X(I),Y(I)
150 PRINT
160 NEXT I
170 AX=X(1):CX=AX:AY=Y(1):CY=AY
180 FOR I=2 TO N
190 BX=X(I):BY=Y(I)
200 PX=MIN(AX,BX):QX=MAX(CX,BX)
210 PY=MIN(AY,BY):QY=MAX(CY,BY)
220 AX=PX:CX=QX:AY=PY:CY=QY
230 NEXT I
240 PRINT "THE X DATA SUPPLIED COVERS THE
     RANGE";PX;"TO";QX
250 PRINT "HOW DO YOU WISH TO SCALE THE X AXIS ?"
260 PRINT
270 INPUT "FROM A MINIMUM SCALE VALUE OF ";X1
280 INPUT "  TO A MAXIMUM SCALE VALUE OF ";X2
290 INPUT "                  IN STEPS OF";X3
300 PRINT
310 PRINT
320 PRINT "THE Y DATA SUPPLIED COVERS THE RANGE"
     ;PY;"TO";QY
330 PRINT "HOW DO YOU WISH TO SCALE THE Y AXIS ?"
340 PRINT
350 INPUT "FROM A MINIMUM SCALE VALUE OF ";Y1
360 INPUT "  TO A MAXIMUM SCALE VALUE OF ";Y2
370 INPUT "                  IN STEPS OF ";Y3
380 PRINT
390 INPUT "WHAT LABEL FOR THE X AXIS";FX
400 INPUT "WHAT LABEL FOR THE Y AXIS";FY
410 INPUT "  WHAT TITLE FOR THE PLOT";FT
420 PRINT
430 CLS
440 RX=X2-X1:RY=Y2-Y1:SX=300/RX:SY=300/RY
450 TAG
460 FOR I=1 TO N
470 KX=INT(SX*(X(I)-X1)):KY=INT(SY*(Y(I)-Y1))
480 IF KX>300 OR KY>300 THEN 550
490 IF TEST(KX+53,KY+55)=0 THEN 530
500 MOVE KX+50,KY+58
510 PRINT "*";
520 GOTO 550
530 MOVE KX+50,KY+58
540 PRINT "+";
550 NEXT I
560 NXT=RX/X3:SXI=SX*X3
570 FOR I=1 TO NXT
580 MOVE 50+(SXI*I),50
590 PRINT CHR$(145);
600 MOVE 42+(SXI*I),37
610 PRINT X1+(I*X3);
620 NEXT I
630 MOVE 50,50:PRINT CHR$(145);
640 MOVE 42,37:PRINT X1;
650 MOVE 350,50:PRINT CHR$(145);
660 MOVE 342,37:PRINT X2;
670 NYT=RY/Y3:SYT=SY*Y3
680 FOR I=1 TO NYT
690 MOVE 44,(SYT*I)+58
700 PRINT "-";
710 MOVE 8,(SYT*I)+58
720 PRINT Y1+(I*Y3);
730 NEXT I
740 MOVE 44,58:PRINT "-";
750 MOVE 8,58:PRINT Y1;
760 MOVE 44,358:PRINT "-";
770 MOVE 8,358:PRINT Y2;
780 MOVE 353,50:DRAW 50,50:DRAW 50,350
790 FOR I=50 TO 354 STEP 4:PLOT I,354:NEXT I
800 FOR I=354 TO 50 STEP -4:PLOT 354,I:NEXT I
810 TAGOFF
820 LOCATE 1,2:PRINT FY
830 LOCATE 20,25:PRINT FX
840 LOCATE 20,1:PRINT FT
850 WINDOW #1, 55,80,8,25
860 WINDOW #2, 55,80,1,5:PAPER #2,1:PEN #2,0
870 PRINT #1, "DO YOU WISH TO RESCALE"
880 PRINT #1, "THE AXES OF THE GRAPH"
890 INPUT #1, "(Y OR N)";G
900 IF UPPER$(G)="Y" THEN CLS:GOTO 240
910 T1=0:T2=0:T3=0:T4=0:T5=0:SD=0:DY=0
920 FOR I=1 TO N
930 T1=T1+(X(I)*Y(I)):T2=T2+X(I):T3=T3+Y(I):T4=T4+
     (X(I)*X(I)):T5=T5+(Y(I)*Y(I))
940 NEXT I
950 MX=T2/N:MY=T3/N
960 FOR I=1 TO N:SD=SD+(X(I)-MX)^2:DY=DY+(Y(I)-MY)
     ^2:NEXT I
970 SR=((T1-(T2*T3/N))^2)/(T4-((T2*T2)/N))
980 ST=T5-(T3*T3/N):RS=ST-SR:MS=RS/(N-2)
990 SL=(T1-(T2*T3/N))/(T4-(T2*T2/N))
1000 YI=(T3/N)-(SL*MX):W=SQR(DY/SD):R=SL/W
1010 CLS #1:CLS #2
1020 PRINT #2,"REGRESSION EQUATION IS OF
1030 PRINT #2,"THE FORM y = a + bx"
1040 PRINT #2,"WHERE     a =";USING "####.###";YI
1050 PRINT #2,"          b =";USING "####.###";SL
1060 PRINT #2,"CORR COEFF =";USING "####.###";R
1070 YO=(SL*X2)+YI:YV=(SL*X1)+YI
1080 IF (YV>=Y1 AND YV<=Y2) AND (YO>=Y1 AND
      YO<=Y2) THEN 1150
1090 IF (YV>=Y1 AND YV<=Y2) AND (YO>Y2) THEN 1180
1100 IF (YV<Y1) AND (YO>=Y1 AND YO<=Y2) THEN 1210
1110 IF (YV<Y1) AND (YO>Y2) THEN 1240
1120 IF (YV>=Y1 AND YV<=Y2) AND (YO<Y1) THEN 1270
```

```
1130 IF (YV>Y2) AND (YD>=Y1 AND YD<=Y2) THEN 1300
1140 IF (YV>Y2) AND (YD<Y1) THEN 1330
1150 X1ORD=50:Y1ORD=INT(SY*(((SL*X1)+YI)-Y1))+50
1160 X2ORD=350:Y2ORD=INT(SY*(((SL*X2)+YI)-Y1))+50
1170 GOTO 1350
1180 X1ORD=50:Y1ORD=INT(SY*(((SL*X1)+YI)-Y1))+50
1190 X2ORD=INT((((Y2-YI)/SL)-X1)*SX)+50:Y2ORD=350
1200 GOTO 1350
1210 X1ORD=INT((((Y1-YI)/SL)-X1)*SX)+50:Y1ORD=50
1220 X2ORD=350:Y2ORD=INT(SY*(((SL*X2)+YI)-Y1))+50
1230 GOTO 1350
1240 X1ORD=INT((((Y1-YI)/SL)-X1)*SX)+50:Y1ORD=50
1250 X2ORD=INT((((Y2-YI)/SL)-X1)*SX)+50:Y2ORD=350
1260 GOTO 1350
1270 X1ORD=50:Y1ORD=INT(SY*(((SL*X1)+YI)-Y1))+50
1280 X2ORD=INT((((Y1-YI)/SL)-X1)*SX)+50:Y2ORD=50
1290 GOTO 1350
1300 X1ORD=INT((((Y2-YI)/SL)-X1)*SX)+50:Y1ORD=350
1310 X2ORD=350:Y2ORD=INT(SY*(((SL*X2)+YI)-Y1))+50
1320 GOTO 1350
1330 X1ORD=INT((((Y2-YI)/SL)-X1)*SX)+50:Y1ORD=350
1340 X2ORD=INT((((Y1-YI)/SL)-X1)*SX)+50:Y2ORD=50
1350 MOVE X1ORD+3,Y1ORD+3:DRAW X2ORD+3,Y2ORD+3
1360 PRINT #1
1370 PRINT #1,"DO YOU WISH TO USE THE"
1380 PRINT #1,"REGRESSION EQUATION TO"
1390 PRINT #1,"ESTIMATE A VALUE OF"
1400 INPUT #1,"X OR Y (Y OR N) ";Q$
1410 IF UPPER$(Q$)="N" THEN 1600
1420 CLS#1
1430 PRINT #1,"DO YOU WISH TO ESTIMATE"
1440 INPUT #1,"X OR Y ";Q$:PRINT #1
1450 IF UPPER$(Q$)<>"X" AND UPPER$(Q$)<>"Y" THEN 1420
1460 IF UPPER$(Q$)="X" THEN 1520
1470 PRINT #1,"FOR WHAT VALUE OF X"
1480 INPUT #1,XH
1490 YH=YI+SL*XH:PRINT #1
1500 PRINT #1,"Y IS ESTIMATED AS"
1510 PRINT #1,YH:GOTO 1570
1520 PRINT #1,"FOR WHAT VALUE OF Y
1530 INPUT #1,YH
1540 XH=(YH-YI)/SL:PRINT #1
1550 PRINT #1,"X IS ESTIMATED AS"
1560 PRINT #1,XH
1570 PRINT #1:PRINT #1,"CALCULATE ANOTHER"
1580 INPUT #1,"POINT (Y OR N) ";Q$
1590 IF UPPER$(Q$)="Y" THEN 1420
1600 PRINT #1:PRINT #1,"DO YOU WISH TO PLOT"
1610 PRINT #1," ANOTHER SET OF POINTS"
1620 INPUT #1,"(Y OR N)";Q$
1630 IF UPPER$(Q$)="Y" THEN RUN
1640 WINDOW SWAP 1,0
```




Open Forum

We are always actively seeking programs for publication — either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation — usually not more than 1000 words — should start with a general description of the program, what it does, and then more detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Lunar Lander

on Spectrum

The object of the game is to successfully land the lunar module on the Moon's surface.

Carefully control how much fuel is burnt and for how long. You must achieve a low velocity when your height is getting low so you do not crash into the moon.

The controls are the number of keys 1 to 9. The amount of fuel being burnt is graphically illustrated by the length of the jet coming out of the module. Your height, velocity and remaining fuel are displayed on the control panel.

Variables

a) Positioning for module
vel Velocity of craft
fu Fuel left ke craft
t od q Time loop variables

Program notes

5 Call user def graphics
6 Define program variables
10-33 Set up positioning var
40-80 Set up display for play
100 Check if burn is absurd
200-236 Calc. new height etc.
234-240 Check if crashing
500 Draw moon surface
505-550 General land sequence
555-570 Additional routine if a crash occured
580 Restart routine
600-620 Successful land routine
1000-1025 User def. graphics

```
   0 REM LUNAR LANDER © SATURN S
OFTWARE 30/1/84 BY ROBERT IRVINE
 AND JOHN IRVINE
   5 GO SUB 1000  BRIGHT 1
   6 LET hi=8100  LET fu=9800  L
ET vel=7000  LET a$="  "  LET z
=0
   7 PAPER 0  BORDER 0  INK 7  C
LS
  10 LET a=5  LET b=25
  15 LET c=6  LET d=25
  20 LET e=7  LET f=24
  25 LET g=8  LET h=24
  30 LET i=9  LET j=24  LET k=9
 LET l=25
  33 LET q=10  LET r=25
  34 FOR s=1 TO 70  LET x=INT (R
ND*250)  LET y=INT (RND*175)  PL
OT x,y  NEXT s
  36 LET m=10  LET n=23  LET o=1
0  LET p=28
  40 PRINT AT a,b; INK 7;
  45 PRINT AT c,d; INK 7;
  50 PRINT AT e,f; INK 7;
  55 PRINT AT g,h; INK 7;
  60 PRINT AT i,j; INK 7;
 PRINT AT k,l; INK 7;
  62 PRINT AT m,n; INK 7;"  " P
RINT AT o,p; INK 7;
  65 PRINT AT 0,10; INK 6;
  "AT 0,2; INK 3;
  ;AT 2,20;
  70 PLOT 0,75  DRAW 0,75  DRAW
125,0  DRAW 0,-75  DRAW -125,0
  75 PRINT AT 0,3;"ON STANDBY";A
T 21,5; INK 5;"PRESS A NUMBER TO
 START"  PAUSE 0  PRINT AT 11,1;
 INK 4;"ALL SYSTEMS GO";AT 21,5;

  76 PRINT AT 4,1; INK 4;"HEIGHT
=";AT 8,1; INK 6;"VELOCITY=";AT
8,1; INK 5;"FUEL="
```

Arcade Avenue

Poke-ing about

I want to start this week by offering an apology to those readers who have written in asking me to rehash things that have already been published. I'm getting so many letters in the Avenue these days that I really haven't got the time or space to go over old ground. This applies especially to *Jetset Willy*, so read your back issues of *PCW* or ask a friend or the library if you have none.

However, I do think it's fair to review the way to get pokes into the computer for those Spectrum owners, in particular Stewart of Aberdeen, who have written in complaining of feeling left behind. You will find that for most games there is a short Basic program at the start that does the job of loading the machine code and auto-runs itself once loaded. If you *Merge* this header program rather than *Loading* it, then once the OK sign appears you can quickly pause the tape and list the header Basic. You will find it has lines to do with loading the code into the memory and as a general rule you can add your poke instructions as a new line after these commands and before any USR command. You then can *Run* the Basic and continue the tape as before. The computer will not forget this short Basic program and will carry out the extra instructions once the machine code is in place.

By the way, Stewart, the Forgotten Abbey is through a hidden passage on the bottom right of the Wine cellar in *Jetset Willy*. It's tough to find and tough to play. In response to a lot of demand I will also relent and publish again the infinite lives poke for Commodore's *Manic Miner*. Glenn Scott of Fife is the most recent supplicant and he also wants to send his thanks for the pokes you sent in for *Blagger*, but now he needs any help you can give to get past Level 9 of *Son of Blagger*. Anyway here, with many thanks to Matthew Crowther of Evesham, are a whole string of cheat programs for the CBM including a treat for those in desperate trouble with *China Miner*.

"Infinite lives on *Manic Miner* type *Verify* (Return), *Load* "",1,1 (Ret and Play), *Poke* 16573, 234 (Ret), *Poke* 16572, 234 (Ret), *Poke* 16571, 234 (Ret), *Sys* 16384 (Ret). Infinite lives on AMC — on slowloader side insert Line 0 *Poke* 11639,255 in the header. Infinite lives on Motor Mania, *Verify* (Ret), *Load* "",1,1 (Ret and Play) *Poke* 8646, 255 (Ret), *Sys* 8000 (Ret)

No enemies on *China Miner*: *Verify* (Ret), *New* (Ret), *Load* "",1,1 (Ret and Play), *Load*,1,1 (Ret and Play) *For* T = 8320 To 16385 *Poke* T,O *Next* (Ret), *Sys* 64738 (Ret)

Whilst on the subject of *China Miner*, thanks to Thomas Turnbull of Ashington who sends the following: "To stop the sprite collision detection feature *Verify* (Ret); *Load* "",1,1 (Ret and Play), *Load* "",1,1 (Ret and Play), *Poke* 34493,169 (Ret), *Poke* 34494,0 (Ret), *Poke* 34495,234 (Ret), then *Sys* 64738 to play."

Let's finish the week with a quick high score letter. Mark Hendley of Clowne near Chesterfield has scored a massive 47 338 on *Ant Attack* (all 10 rescued), and on *Chuckie Egg* 150,230.

Tony Kendle

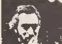
The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments from playing tips on difficult games or programs you'd particularly like to praise (or blame) then write to Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD

```
 90 LET i$=INKEY$: IF INKEY$="" THEN GO TO 200
 100 LET z=VAL i$
 200 FOR x=1 TO z
 204 PRINT AT 4,0,hi," ",AT 6,10,vel," ",AT 8,7,fu," "
 205 LET q=q+1
 210 PRINT AT q,r, INK 5,a$
 215 NEXT x
 217 LET q=10: LET r=28
 220 FOR x=1 TO z
 222 LET q=q+1
 230 PRINT AT q,r," ": NEXT x
 232 LET vel=vel-(z*z): LET hi=hi-(z*7): LET fu=fu-(z*z): IF z<5 THEN LET vel=vel+(z*5)
 233 IF z=0 THEN LET fu=fu-(z*0)
 234 IF hi<0 AND vel<0 THEN GO TO 500
 235 IF vel<5 AND hi<>0 THEN GO TO 600
 236 IF vel>50 AND hi<4 THEN GO TO 500
 237 IF fu<0 THEN GO TO 500
 240 LET q=10: LET r=25: GO TO 6
 500 PLOT 0,0: DRAW 250,0
 505 FOR v=1 TO 11
 510 LET a=a+1: LET c=c+1: LET e=e+1: LET g=g+1: LET i=i+1: LET k=k+1: LET m=m+1: LET o=o+1
 512 PRINT AT a-1,b;" ": PRINT AT g-1,f;" ": PRINT AT e-1,f+4;" ": PRINT AT e-1,n;" ": PRINT AT e-1,n+8;" "
 515 PRINT AT a,b;"  "
 520 PRINT AT c,d;"  "
 525 PRINT AT e,f;"  "
 530 PRINT AT g,h;"  "
 535 PRINT AT i,j;"  ": PRINT AT k,l;" "
 540 PRINT AT m,n;"  ": PRINT AT o,p;" "
 550 NEXT v
 555 IF hi<5 AND vel<0 THEN GO TO 500
 560 PRINT AT a+6,b-6;"  ": PRINT AT a,b;"  ": PRINT AT c+2,d+2;"  ": PRINT AT c,d;"  "
 565 PRINT AT e+1,f-3;" USA ": PRINT AT e,f;"  "
 566 FOR q=1 TO 255: OUT 254,q: OUT 254,q: NEXT q: OUT 254,0
 567 PRINT AT 11,0; INK 2;"SHUTTLE CRASHED"
 568 FOR l=1 TO 500: NEXT l
 570 CLS : PRINT : PRINT "BAD LUCK YOU CRASHED": PRINT : PRINT "THE SHUTTLE AND": PRINT : PRINT "THERE ARE NO SURVIVORS!!"
 575 PRINT : PRINT "ANOTHER GAME (Y/N)"
 580 IF INKEY$="" THEN GO TO 580
 582 IF INKEY$="y" THEN RESTORE : CLS : GO TO 5
 585 IF INKEY$<>"y" THEN PAPER 7: BORDER 7: INK 0: BRIGHT 0: CLS : GO TO 8000
 600 PRINT AT 11,1; INK 2;"SHUTTLE LANDED"
 604 FOR e=1 TO 7: BORDER 8-e: BEEP .5,e: NEXT e
 605 FOR l=1 TO 500: NEXT l
 610 PAPER 1: BORDER 4: INK 7: CLS
 615 PRINT : PRINT "CONGRATULATIONS YOU HAVE": PRINT : PRINT "LANDED THE SHUTTLE": PRINT : PRINT "AND THERE ARE NO INJURIES!!"
 620 GO TO 575
 1000 FOR t=USR "a" TO USR "f"+7: READ u: POKE t,u: NEXT t
 1005 DATA 128,64,32,16,8,4,2,1
 1010 DATA 1,2,4,8,16,32,64,128
 1015 DATA 255,255,0,0,0,0,0,0
 1020 DATA 128,192,224,240,248,252,254,255
 1025 DATA 1,3,7,15,31,63,127,255
 1030 DATA 255,0,0,0,0,0,0,0
 1035 RETURN
```



Lunar Lander
by Robert Irvine

The Music Box



BBC package

Having just received my Acorn Music 500, I'm holding back the promised information on digital sound samplers for the Spectrum until next week. The Acorn system deserves a column to itself.

The Music 500 (produced by Hybrid Technology of Cambridge) is, in effect, a music composition language plus the hardware necessary to make it worthwhile using. How much each of these components contribute to the £199 price tag is hard to say. However, the hardware — a separately powered disk-drive casing with a couple of dozen chips and a stereo audio output — does take the BBC out of the acoustic dark ages.

There are 13 programmable waveforms, 13 envelopes and seven available stereo positions. Up to 16 notes can be played at once, allowing a number of parts and voices to be used. There are numerous effects available — including ring modulation, frequency modulation, phasing, detuning and pitch and amplitude control. All-in-all, an impressive spec, even if the manual gives far too little information to understand the how and why of the device (I didn't recognise three of the chips on the circuit board and, until I can track them down, I can't give you much of an idea as to what techniques the Music 500 uses.)

Quite whom the package is aimed at is hard to tell. On the one hand, the software (known as AMPLE — Advanced Music Programming Language) is sophisticated and not, at first sight, simple to use (despite the manual's promise). AMPLE is a whole new programming language with some apparent affinities to Basic and some to Forth.

On the other hand, the manual's introductory paragraphs and the use of a five-pin DIN socket for the audio output suggest the home market — especialy homes equipped with a good quality stereo.

Unfortunately, the manual is less than clear on programming and this column has to be largely a preview since Music 500 will take me several days to begin to get to grips with. This is not a package in the ordinary sense — as it stands, it doesn't make writing or performing music easy, it just provides tools which might be used to that end.

On the whole, the system seems powerful and attractive — if a little overpriced. There is a keyboard add-on available already (but I have no information on it) and, no doubt utilities such as scoring packages will become available. In a couple of weeks, I'll report in more detail on the Music 500's talent for sound synthesis.

Until then, you may like to reflect that Island Logic's composer/synth package for an unexpanded BBC costs around £30 and includes a score writer, while for £12.50 (£9.95 for the tape version) you can buy the excellent Synthy-64 composer for the Commodore.

Gary Herman

The Music Box is a new weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD

Open Forum

Base Attack

on Vic20

Unfortunately, only a part of the listing for *Base Attack* was printed in *PCW*, 13 December. Here, with our apologies, is the remainder of the program.

```
[illegible]
5030 [illegible]
5040 IF [illegible] THEN [illegible]
5050 IF [illegible] THEN [illegible]
5060 IF [illegible] THEN [illegible]
5070 IF [illegible] THEN [illegible]
5080 IF [illegible] THEN [illegible] TO9D8C
[illegible] NEXT
[illegible]
2560 POKE [illegible]
2570 POKE [illegible] 0
2580 GOTO2000
10000 POKE36869 240
10010 PRINT "[illegible]
10020 PRINT [illegible]
10030 PRINT [illegible]
10040 PRINT [illegible]
10050 PRINT [illegible]
10060 PRINT [illegible]
10070 PRINT [illegible]
10080 PRINT [illegible]
10090 PRINT PRINT PRINT PRINT
10100 PRINT BUT SCORED SC"                    POINTS"
10115 PRINT "[illegible]AGAIN
  (Y/N)"
15000 GETX$ IFX$=""THEN15000
15010 IFX$="Y"THENRUN
15020 IFX$="N"THENPRINT"[illegible]" POKE36879 27 END
15030 GOTO15000
30000 IFO=>5THENO=0 GOTO130
31100 GOTO250
49990 PRINTCHR$(14)
50000 PRINT"[illegible]"
50010 PRINT"THE OBJECT OF THE GAME"
50020 PRINT"IS TO DEFEND YOUR BASE"
50030 PRINT"FROM THE EVER   COMING'
50040 PRINT"[illegible]. THEY COME IN '
50050 PRINT"FIVE FORMS & ALL MOVE '
50060 PRINT"AT DIFFERENT SPEEDS."
50070 PRINT [illegible]
50080 PRINT" [illegible] DOWN [illegible]"
50090 PRINT"[illegible](RIGHT)[illegible]"
50100 PRINT [illegible]
50110 PRINT [illegible]
50120 GETA$ IFA$=""THEN50120
50130 PRINTCHR$(142) GOTO7
```

Book Ends

Book *Machine Code for Beginners on the Amstrad* **Price** £6.95 **Micro** Amstrad **Supplier** Micro Press, Castle House, 27 London Road, Tunbridge Wells, Kent

Here is a slim, rather expensive volume aimed at the Amstrad owner with little programming experience (despite the 'Crash Course in Basic' appendix, I wouldn't advise it for the absolute beginner) who wants to devote his or her time to artificial intelligence.

The book looks at the various procedures necessary to develop an interactive program which will simulate intelligent conversation. This introduces string manipulation, data handling, error trapping, flow charts, etc.

Sadly it does not go beyond this point to discuss 'learning' programs such as *Animal*, games playing and other areas of A.I. experimentation.

Younger readers may therefore find it useful, but I'd advise older and more experienced programmers to look elsewhere to a perhaps less friendly, but broader based study.

John Minson

Book *On the Road to Artificial Intelligence Amstrad CPC 464* **Price** £8.95 **Micro** Amstrad CPC 464 **Supplier** Shiva Publishing, London, 64 Welsh Row, Nantwich, Cheshire CW5 5ES

Machine code will never be easy to learn but Steve Kramer here describes it in terms of Basic to good effect, likening the registers to integer variables, etc. and so overcoming the hurdle of comprehending the workings of the CPU. His book also contains several useful appendices and each chapter ends with a summary of the commands introduced.

I felt, however, that something didn't quite work. Perhaps it was the informal style that seemed to fall flat too often. Or perhaps it was because even when the main instructions are understood, there's still a long way to go before they can be used to do anything spectacular.

Still if you want to go beyond Basic and are willing to put in some hard work, this book could start you off.

John Minson

Book *Micro Mates Simple Shapes and Pictures, Simple Movement and Animation, Simple Music and Sound Effects* **Price** £1.95 **Micro** BBC/Electron **Supplier** Granada Publishing, 8 Grafton St, London W1.

These are three examples of a new series from Granada for the beginner who has a grasp of Basic and wants to start using it in more creative directions. Each is small, slim (around 60 pages), colourful and rather hi-tech chic with a dot-matrix type face.

Simple Shapes and Pictures shows most signs of padding, with large amounts of space given over to somewhat garish computer graphics. *Movement and Animation* is rather heavier on substance, though light on really useful results, while the *Sound* volume is probably the best of the three.

The main problem is that these books fail to place their topics in context, but despite this lack of interaction, there is a certain amount of duplication, making each volume even slimmer in effect.

While glossy and cheap enough to be an impulse buy from pocket money, it would be more profitable to save up and buy a more complete, workmanlike guide to programming instead of some.

John Minson

Graph Plot

on Amstrad

This program for the Amstrad CPC464 will plot a graph of any function on the monitor, over the range of x values specified by the user. The program will position and scale the axes such that the whole of the screen is used for drawing the graph. The program shows the flexibility of the Amstrad's graphics commands.

Program notes

100 — 290 Initialisation
300 — 390 Calculation of points coordinates
390 — 550 Calculation of scales of axes & position of origin
560 — 660 Plotting of graph
10000 — 10050 Handling of errors

The user's function must be entered into line 190 after *Def Fnf* (x)=. On running, the user will be asked to enter the lowest x value followed by the highest x value, and the step. The computer will then calculate the points & plot them. After the graph has been plotted, pressing [*Space*] will use the same function, but ask for another set of x values, or pressing [F] will display the function, which may then be altered if necessary.

```
100 REM Function Plotter
110 REM (c) R.P. Morgan +
B. Nicholson
120 :
130 :
140 REM ****************************
150 REM * YOUR FUNCTION GOES BELOW *
160 REM ****************************
170 :
180 :
190 DEF FNf(x)=LOG(x)
200 :
210 :
220 ON ERROR GOTO 10000
230 MODE 1
240 DEG
250 INPUT "Lower X value ";xl
260 INPUT "Upper X value ";xu
270 INPUT "Step size ";s
280 CLS
290 SPEED INK 50,30
300 LOCATE 14,10:INK 3,24,1:PEN
3:PRINT "CALCULATING"
310 xcoords=(xu-xl)/s
320 DIM x(xcoords+2),y(xcoords+2)
330 nu=1
340 FOR xcoord=xl TO xu STEP s
350 x(nu)=xcoord
360 y(nu)=FNf(xcoord)
370 nu=nu+1
380 NEXT xcoord
390 nu=nu-1
400 ya=y(1):yb=y(1)
410 xa=x(1):xb=x(xcoords)
420 FOR f=1 TO xcoords
430 IF y(f)>yb THEN yb=y(f)
440 IF y(f)<ya THEN ya=y(f)
450 NEXT f
460 yscale=400/(yb-ya)
470 xscale=640/(xb-xa)
480 FOR f=1 TO xcoords
490 x(f)=x(f)*xscale
500 y(f)=y(f)*yscale
510 NEXT f
520 y0=ABS(0-ya)
530 yorig=y0*yscale
540 x0=ABS(0-xa)
550 xorig=x0*xscale
560 MODE 2
570 MOVE xorig,0:DRAW xorig,400
580 MOVE 0,yorig:DRAW 640,yorig
590 ORIGIN xorig,yorig
600 FOR f=1 TO xcoords
610 PLOT x(f),y(f)
620 NEXT f
630 a$=INKEY$:IF a$="" THEN 630
640 IF a$="f" OR a$="F" THEN MODE
1:LIST 190:END
650 RUN
10000 MODE 2:PEN 1
10010 IF ERR=11 THEN PRINT "Your
range & function involves a
division by zero in line "ERL:GOTO
10050
10020 IF ERR=6 THEN PRINT "Your
range & function involves a number
too large for, or undefined for,
the    computer in "ERL:GOTO 10050
10030 PRINT "Error number "ERR" in
line "ERL
10050 END
```

Graph Plot
by R Morgan

3D Maze

on Vic20

You will need the super expander for this program.
When you run this program you will find yourself in a 3D maze.
Controls:

M to move forward
L to turn left
R to turn right
If you escape you'll be told the number of moves you took.

Program notes

Line	
1	Defines the size of the maze — 25 locations, 4 views from each location
2	Puts the numeric value of each view/location into the array
10-20	Determines at random your starting point in the maze
70-80	Sets the Graphic Screen and prints the view for the direction you are facing in your starting location
110-140	You can only press "L" to look left, "R" to look right and "M" to move forward
150	Increase the number of moves taken so far
300-310	Turn left routine
400-410	Turn right routine
500-510	Checks that a move forward is allowed
520	Checks to see if you've completed the maze
530-570	Moves your location, you are still looking in the same direction
600-675	Decisions for which walls to draw
680-770	Each line draws a wall
1000-1030	Your score on completing the maze
1040-1070	Data statements holding the numeric value of each view

```
1 DIMA(25,4)
2 FORB=1TO25:FORT=1TO4:READA(B,T):NEXT:NEXT
10 B=INT(RND(1)*24)+1
20 U=0:T=0
70 GRAPHIC2
80 SCNCLR:GOSUB600
100 GETA$
110 IFA$="L"THEN300
120 IFA$="R"THEN400
130 IFA$="M"THEN500
140 GOTO100
150 V=V+1
160 GOTO600
300 T=T-1:IFT<1THENT=4
310 GOTO150
400 T=T+1:IFT>4THENT=1
410 GOTO150
500 Z=[illegible]
510 IFZ=0THEN100
520 [illegible]
530 IFT=1THENB=B-5
540 IFT=2THENB=B+1
550 IFT=3THENB=B+5
560 IFT=4THENB=B-1
570 GOTO150
600 [illegible]
[illegible]
```

3D Maze
by M Dixon

Tony Bridge's Adventure Corner



Best of 1984

1984 has seen an explosion in games of all sorts and adventures have never had it so good. The blockbusters of the year will be well known to you and need no further eulogies from me. Each machine has had a best selling adventure written for it, but unlike arcade games, less well known adventures can be just as much fun to play

The BBC, for example, has an excellent range from Acornsoft. Each one — *Philosopher's Quest*, *Kingdom of Hamil* *Countdown to Doom* and the others (including a new list of recently released titles) — is a tough adventure guaranteed to keep even the expert busy Along with the Level 9 series, these are the obvious programs to think of for the BBC owner, who is rather poorly catered for But Epic Software has a small selection of very well liked adventures, such as *The Wheel of Fortune* and they're all good value, though without full-colour packaging I suppose, however, that all you Beebers are currently slumped over your machines trying to become *Elite*.

This two-tier pattern, of big hits and a constant ebb and flow of minor, but nonetheless interesting second leaguers is perhaps more clearly seen in software for those two contenders for the title of Best Selling Computer in Britain — the Spectrum and Commodore 64. For both machines, the past year must count as the great year of success in adventure games as in the other areas of arcade games business and utility programs and add-on hardware On both sides of the Atlantic, millions of lines of code have been written and thousands of pages of full colour advertising have been pressed into service in an all out attempt to part computer users from their money

Although the software business in America is rather different from that in Britain, there is still a small sector of games producers who cannot or will not afford flashy boxes and full page adverts Judging by the computer magazines that we see in Britain, that division is far greater in the US than that which separates the big sellers from the also-rans here at home

Let me say now that games, both arcade and adventures, are of a much higher quality in the States — they are written with more style, panache, elan, than the home grown examples. Text adventures is the only arena in which we can compete and those from Level 9, Channel 8 and one or two others compare favourably But as far as graphic adventures and arcades are concerned, there is no comparison. All those reviewers who roll out the trad old phrase, 'Yet another *Manic Miner* derivative' forget that MM itself is just a rather unappetising version of *Miner 2049'er*, a much more addictive and stylish game altogether

The American game is simple but effective in the extreme. Atari owners will know what I mean when I say that there is no European substitute for the games available — even Commodore games must take a back seat to the Atari catalogue The Atari machines are the games machines of the present time (and pretty good business machines too) and for the forseeable future

Unlike arcade games top selling adventures are top selling largely because the packaging is better The honourable exceptions are those games such as *The Hobbit*, the Midnight saga, and the Level 9/Channel 8 series which on the whole (Hobbitbugs not withstanding) display better writing techniques and push back the boundaries further than lesser programs.

Lower down the adventure charts are games which are just as good as many of those near the top Among those adventures I found myself returning to during 1984 were:

Denis Through the Looking Glass (Applications)
A Quill'd adventure which many people felt to be too far removed from the traditional hack n'slay But the unique use of verse and the sneaky way in which the player is forced to get Denis to a tincture avery so often, ensures a good puzzle It also ensures that the authors will not appear in the New Year's Honours List!

The Journey (Temptation)
Not so much for the program itself, although the animation is the equal of *The Hobbit's* and the scenario is a good one but because the author, Alan Davis is a long-time Corner correspondent, and it is always nice to see a good Adventurer player produce his own program.

Lords of Time (Level 9)
Written by another Corner correspondent, Sue Gazzard, LOT has one of the very best Adventure scenarios — any one of nine time zones may be visited by the player and each has its own unique problems Programmed with the usual Level 9 flair, LOT was nevertheless a departure from Level 9's previous Tolkienesque adventures and w great fun to play

Quest for the Holy Joystick (Delta 4)
There have been several attempts at comic adventures, such as Denis and Infocom's *Planetfall*, and this modest Quill'd program is one of the better attempts

It's a very difficult task to write a truly funny adventure and this collection of gaming in-jokes succeeds admirably Here, you'll find *Valhalla* graphics, *Hobbit* dungeons, Roland Rat and several *JSW* pokes as well, as well as one of the reasons I come back to the Quest — the appearance of a certain bespectacled, bearded Elf.

The program is very short, though, and should possibly have appeared as a give-away bonus on the B side of a more complex adventure

Suspended (Infocom)
Although none of Infocom's adventures are far from my computer, *Suspended* is the one to which I return most often, and not only because I have still only just scratched the surface The original packaging included a playboard on which to keep track of the progress of your six robots around the computer complex, as they try to repair the environmental computers of planet Contra.

I don't know if this feature appears in the recently released version for the Commodore (surely one of the great bargains for CBM adventurers) Such is the nature of Infocom's magic, that each game will be totally different from the last.

Next week I will take another look at some more adventures

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair — help is at hand

Fill in the coupon, explaining your problem send it to us and a fellow adventurer may be able to help

Remember — the system only works if those adventurers who have solved the puzzles get in touch Every week is Save An Adventurer Today (SAAT) week!

Adventure .... on (micro) ....

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This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly*, 12-13 Little Newport Street London WC2H 3LD.



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COMMODORE 16 SOFTWARE

[ ] Commodore 16 Games Pack I	£5.95
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All versions of 'The Hobbit' are identical with regard to the adventure program. Due to memory limitations BBC cassette version does not include graphics.

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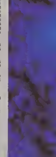
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POPS/TRA



Castle Of Terror is a superb graphic adventure game set in the 1880's when and where "Dracula" stories abounded. You are in a village near a large Castle in which the secretive Count lives. You must travel about the village, collecting items which may be of use to you on your bold mission.

You must also find out what your mission is by talking to the right people. But don't be fooled!

- ★ Multi-word "English Language" style input
- ★ Superb, highly detailed graphics
- ★ Animated characters, special effects and sound.

Surviving is success enough, but escaping with the treasure is the ultimate achievement and won't be easily accomplished!

CASTLE·of·TERROR



Melbourne House

Peek & Poke



CP/M compatible

Anon of Huntingdon, Cambridgeshire, writes.

Q **I have heard that with the disc drive the *Amstrad* is CP/M compatible, but does this mean it would be the same as MSX? Also, I have heard that a Spectravideo is MSX standard, but does this include the SV-318?**

A With a disc drive attached, the Amstrad would become capable of running under the CP/M operating system. Hopwever yopu would need to purchase CP/M which is not a cheap item. MSX is entirely different to CP/M, and the Amstrad will not and does not conform to the MSX standard.

Despite all claims to the contrary, the SV-318 is not an MSX machine. It was designed to be, but MSX itself had not been finalised when the machine was first launched. It is therefore not possible to utilise the full facilities of MSX.

Merged sets

P Johnston of Choppington, Northumberland, writes

Q **I have been reading your magazine since I bought my 48K Spectrum over a year ago, and I have finally decided to write for help. My question is as follows. I have begun writing a pontoon game using a compiler, and I need more than one set of UDG's to be available. Is there any way of 'merging' about two or three sets of UDG's into the completed program, and if so please explain this method.**

A You can use the same method of achieving multiple sets of UDG's that is used by the Basic programmer

As you know UDG sets can be saved as code, and loaded (above Ramtop), in the same way as machine code subroutines. As long as you know the address at which each set starts it is only necessary to place that address in locations 23675 and 23676 (the address of the first UDG)

You can swop between sets of graphic characters as many times as you like in your program, but can only use one set at a time.

Wrong correction

G G Robertson of Edinburgh, writes

Q **In the 11th October issue, you corrected a statement for a program 'Decimal to Hex Conversion', in the book *Spectrum Machine Language for the Absolute Beginner* (page 23). I put in the correction and ran it, only to find that it only gave the first 15 numbers, stopping at 16. As Kevin Jenkins asked, is it the fault of the computer or the book?**

A In order to solve your problem, and also to kill any lingering doubts that you might have concerning your computer, I will give an absolutely, definitely, most certainly correct version of the program concerned.

```
100 REM decimal to hexadecimal
conversion
110 PRINT ' "Please input decimal
value."
120 INPUT n: PRINT n
130 LET S$ = ""
135 LET n2 = INT (n/16)
140 LET n1 = INT (N-n2*16)
150 LET S$ = CHR$ ((n1<=9) *
(n1+48) + (n1>9) * (55+n1)) + S$
160 IF n2 = 0 THEN PRINT PRINT
"HEXADECIMAL",S$ "H" FOR i =
1 TO 200: NEXT i: GO TO 110
170 LET n = n2: GO TO 135
```

Program editing

Merv Astle of Lincoln, writes

Q **I intend buying a BBC B and Datacorder mainly for extending my knowledge of Basic and compiling my own programs. What do you think of the Brother EP44 as a printer? It will be mainly used for program editing and listing.**

Also, how much are you charged when using a modem (in respect of the phone bill) Are you charged all the time it is connected or only when receiving data?

A I would think that the Brother EP44 would be very suitable for your purpose There are of course other printers which would be equally as good for your purposes as well, but none of these offer sufficient advantages to make me suggest them instead of the machine you have chosen.

As far as use of a modem is concerned, your fear is well founded in that as you are using normal telephone lines when using a modem, you are liable to normal call charges for the duration of your connection.

Amstrad printer

C G West of Malton, North Yorkshire, writes

Q **I am asking for help about the purchase of printers. Amstrad offer a printer unit. I would like to know whether there is any other printer that can be used with the Amstrad and the Sinclair QL.**

I have recently seen advertisements for the new Mannesmann Tally Spirit MT80 printer, which is said to be suitable for the QL and other home computers. Is this the particular one to choose?

A I have received many letters on the subject of which printer to choose for a particular machine My answer is very nearly always the same...it depends on what you want to use the printer for and how much you are prepared to spend.

The QL and the Amstrad use standard printer interfaces and thus are able to use most of the available micro computer compatible printers The Mannesmann is a good example of this. There are however a large number of printers on the market in a variety of different price ranges You will need to look into the price range you want for the sort of quality you require.

The only piece of advice I would give is that before buying you ask for a demonstration. It ensures that you will not be disappointed at the results when you get your printer home

Also, get the sales person to put in writing that the printer will work with your micro and also state what interface you will need to use

A Slow operation

Stuart Gregg of Leeds, writes.

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WANTED BBC MODEL B or Commodore 64 with extras. Will swap my Alhambra classical guitar Model 9C with music stand foot stool and carrying case Tel 01 363 3363

WANTED BBC MODEL B 1 2 O S + DFS and disc drive + any Roms software etc. Offers around £350

BBC SOFTWARE for sale half price. All original Snowball Hobbit, Fortress 4 8 yrs educational. Wizard interface for joysticks. Basingstoke 51522

FOR SALE BBC + s/w + books worth £00 48K Spectrum with s/w and manuals £500 00 Tel 01-466 3571

BBC B ACORN DFS Teac 40/80 track disk drive Raven 20 16K sally disk sideways ram speech synth acoustic modem overdwire graphics rom + lots more £730 ono Tel 01 505 0063

BBC B FOR SALE + Quick shot joystick Acorn Prestel Ram Acorn modem + £150 s/ware - £500 ono Will seperate Tel Jon 0422 63719 after 6 weekdays anytime weekends

BBC SOFTWARE Elite £9 Jet Pac £9 Zalaga £4 Missile Base Space Fighter Galaxy Wars £3 each (0629 51076 weekends only Wanted Sabre Wulf 3D Grand Prix.

BBC B 1.2 OS with sola recorder books and software mostly adventures (Mixed Five Level 9's etc) £285 or swap for CBM 64 with disk drive Tel Ray 0902 332076

Acorns for sale

AMSTRAD GAMES ½ Price all originals + Amstrad Tasprint £12.00 Tel 0272 858034 after 4 30 pm

ANY CBM 64 S/W to swap Tel for S Moore 0638 32345

WANTED 48K SPECTRUM With Interface II tape deck joystick etc. Will pay £100–140 Depending on quality + extras etc Tel 065671 342 after 7 pm. BBC will pay £200 Tel Workington 61004

ORIGINAL BBC S/W wanted to buy Tapes or disks. Tel (05827) 68152

WANTED SPECTRUM 16K or 48K preferably issue 2 or 3. Will pay up to £80 for working 48K machine! Phone Redhill 65880 after 5 pm

Wanted

DRAGON 32 wanted complete with PSU cables manual. Unemployed so can afford no more than £50. If possible can I pay £10 a fortnight. Contact R Hambleton 22 Grundy St. Nottingham

SWAP Spectrum 48K, Interface Microdrive 4 cartridges software dust cover, (Spectrum under guarantee) for commodore 64 with C2N unit. Phone 01 207 1804 ask for Douglas

Wanted

WANTED Commodore 64 software. Preferably on disk. Tapes also considered especially Dalek 1 or Disco or similar. Good games, Business and utility software wanted. Please telephone (0382) 4497. Ask for Mitchell.

WANTED Second hand Oric or Atari software. Send list stating price required for each tape to R. Gruszka, 113 Broomfield Road, Marsh Huddersfield (originals only). Tel 35606 Huddersfield.

WANTED Atari VCS and Atari computer software Roms cassettes. No disks. Also need VCS s/hand machine. J Haighey, Waterloo Place, Conegal Town, N. Ireland.

WANTED ZX 80 with 4K Rom in good condition with manual. Rampack, software etc. Info price to Charles Byler, Roemer Strasse 140A, 6900 Heidelberg 1, Germany.

WANTED Printer for Sinclair Spectrum Epson, Shinwa etc. Also software. Tel 01 652 9546 after 6 or Weekends.

SWAP my 3 waveband Amstrad stereo hi fi tuner (hardly used) for your Spectrum interface one. Will consider microdrives. Tel. 0392 382684 anytime.

SPECTRUM Version 20 Hour Basic book only wanted. Also Dr Watson Basic package and 16/48 magazine tape no. 11. Phone 01-800 6767 after 7pm.

WANTED Apple IIE, Brother EP44 printer. Tel 01-486 9810 R. Gal

ADVENTURE HELPLINE

Sherlock on Spectrum. I can't catch the train to Leatherhead and I keep ending up going around the London Underground. Nick Pinnell, Penrhos, Green Lane, Churt, Farnham, Surrey

Final Mission on Spectrum. What light blue hedgehogs come from Italy? S J Green, Gwema, 8 Cathedral View, Llangaloes, Aberystwyth.

Planet of Death on Spectrum. I can't do anything in the space ship. I have the starter motor, mirror etc. Please help! Please. Mark Hewdley, 8 Romeley Crescent, Clowne nr Chesterfield, Derbyshire.

Smugglers Cove on Spectrum. How do you use the message on the wall to get through the room with the pentangle in the centre? A J Norris, 234 Salisbury Road, Totton, nr Southampton.

Message from Andromeda on Spectrum. What do you do with the glass pedestals in the crystal chamber and the blue room? Please rid me of my acute depression. Cliff Joseph, 4 Loris Close, Thurlow Park Road, Dulwich, London SE21

Valhalla on Spectrum. I have got Ofnir and Drapnir but I can't get any further. How do I get Skornir? Steve Dua, Fleamore House, Culmstock, Cullompton, Devon.

Voodoo Castle on C64. How do I enter the cell and where are the two charms? Mrs P Taylor, 187 Uplands Road, West Moors, Wimborne, Dorset.

Temple of vran on Spectrum. I would like to know how to cross the quicksand? How do I get through the hole in the wall? Mark McMahon, Goneeves, Baharbus, Co Cork, Eire.

Colossal Adventure on C64. How do I escape the flood in the hall of sleeping dwarfs? J H McAdam, 5 Otterburn Gardens, Whickham, Newcastle-upon Tyne

Gisburne's Castle on Electron. How do I get into the chapel and how do I open the rusty door? Malcolm Bennee, 6 Fraser Gardens, Kirkintilloch, Glasgow

Ship of Doom on Spectrum. I cannot turn the key or open the door in the computer room. What is at the end of the long corridor? J P A Buckle, 188 Barnsley Road, Cudworth, nr Barnsley, S Yorks

Adventure Quest on BBC. How do you get past the river and how do you get to the other side of the lake? J A Boman, 5 Church Lane, Elvington, nr York, N Yorks

Sherlock on Spectrum. I can get out of the house and into handsome cabs and trains — but nothing else! Help! Allan Paulley, 35 Clarkefield Street, Oldham, Greater Manchester

Twin Kingdom Valley on C64. How do you get the bronze from the witch? How do I keep the strong elf with me? Derek Hutchinson, 81 Ashburn Road, Hadrian Park, Wallsend, Tyne and Wear

The Sorcerer of Claymorgue Castle on C64. I can't get past the dragon or cross the lava stream. N Fellows, 1 Park Crescent, Dovridge, Derbyshire

Hobbit on Spectrum. Somebody please help me escape from the goblins' dungeon! How do I kill the dragon? Mark Handley, 6 Romeley Crescent, Clowne, nr Chesterfield, Derbyshire

Heroes of Karn on C64. How do you get the wands? Where are the other three heroes — and Baron? Paul Benham, 26 St James Avenue, Whetstone, London N20

Heroes in Eden on BBC. How do I avoid getting fried but the engines of Snowball 9? Graham Jones, 14 Cornwall Road, Rishton, Blackburn, Lancs.

Castle of Riddles on BBC. Has anyone completed this adventure? How many treasures are there? How do I get the ring? Jan Wiffill, 18 Auckland Road, Ford, Plymouth, Devon.

Circus on C64. How do I wake the tiger? Where is the clown's note? P A Taylor, 187 Uplands Road, W Moors, Wimborne, Dorset

Dungeon Adventure on Lynx. I can't get past the giant bee and I can't get a weapon. Craig Burchall, 12 Western Avenue, Henlow, Beds

Classic Adventure on C64. How do you open the gate to the treasure vault in the end-game? Michael Taysum, 13 Hazelton Road, Bishopston, Bristol BS7

Sphinx on Electron. How do you get east from the everglades? What does 'Dave knew' mean? Sphinx Adventurer, 4 The Avenue, The Haugh, Bolton.

Pyramid 2000 on TRS-80 Color. How do I pass the serpent in the pharaoh's chamber or get the gold nugget up the steps of the hall? R Randall, 1 Mill Road, Frindsbury, Rochester, Kent.

Kentilla on Spectrum. Where can I find the small key to open the doors? C S Rainer, 2 Mill Hill Road, Hinckley, Leicestershire

Heroes of Khan on C64. How do I get past the serpent and is there a way across teh chasm? Ian Anthony, 68 Borrowdale Avenue, Fleetwood, Lancs.

Planet of Death on Spectrum. How do you get past the force field with the loudspeaker and disco meanie? Sean Higgins, 9 Walmer Grove, Erdington, Birmingham.

Cimson Moon on Dragon. I've got the shield belt and maul gun. How do I get the yellow disk? D A Probyn, 5 Emberton Street, Chesterton, Newcastle.

Adventure on ZX81. How can I get past the deep pit? How can I open the ancient chest? Jacqui Augeustis, 9 Sefton Road, Wallasey, Merseyside L45.

Message from Andromeda on Amstrad. How do I cross the crystal bridge? Colin Bachelor, 100 Pinks Hill, Swanley, Kent.

Wheel of Fortune on Electron. How do you get down the wall without being killed. I have the bucket. Darren Owen, 52 Partridge Close, Chelmsleywood, Birmingham.

Eureka on Spectrum. In the prehistoric age I cannot get past the brachiosaurus. I will help on any other Eureka adventure in return for info. Mike Levers, 45 Lilliesfield Avenue, Barnwood, Gloucester

Hobbit on C64. When you are in the goblins' dungeon, how do you get out through either the door, window or trap door? Nicholas Jones, 52 Park View Road, Lytham, Lancs.

Wrath of Magra on Spectrum. How do you get past the guardian to enter Magra's fortress? John Whelan, 114 Laburnham Grove, Runcorn, Cheshire

Time Machine on C64. What do you do with the police box? I've got the three crystals in the sockets. Peter Dent, 11 Stavordale Street West, Seaham, Co Durham.

Pirate Cove on Vic 20. How do you get past the snakes in the monastery on the treasure island? Nicholas White, 13 Delmere Close, Eastfield, Peterborough (Tel. 0733 68874)

The Quest on Vic 20. How do you continue your journey after reaching the ocean? (I was told to wear the cloak/gloves and say Tsasth, but this does not work) Nicholas White, 13 Delamere Close, Eastfield, Peterborough (Tel. 0733 68874)

Twin Kingdom Valley on C64. I can't get the master key from the Dragon on the desert king's north tower. Simon Quartermaine, 2 Oakdene, Cheshunt, Herts.

Voyage into the Unknown on Spectrum. How do I get past the radiation shield? What do I do on Roocam? David Ireland, 31 Queen's Road, Tunbridge Wells, Kent.

Planet of Death on ZX81. How do you get through the maze and force field? Brian Turner, 16 Stockwood Road, Stockwood, Bristol.

Tombs of Xeiops on C64. I cannot get the torch lit, and how do you through the sandy door? David Raine, 37 Caroline Gdns, High Howden, Wallsend, Tyne and Wear

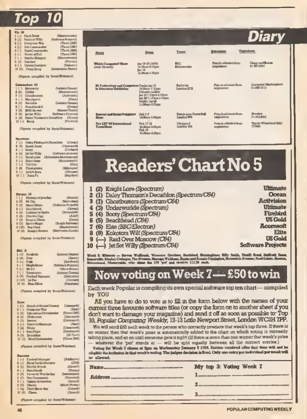
Adventure Land on Vic 20. I cannot find all thirteen treasures, although I do have the ring, bracelet, rubies, fruit, ox, honey, eggs, crown, net, mirror, fish and rug. Thomas Jelfs, 8 Rupert St, Radcliffe, Manchester

Knight's Quest on Spectrum. How do I get past the snake on the basket? Conn Iggolden, 80 Elm Avenue, Eastcote, Ruislip, Middlesex.

Madness and the Minotaur on Dragon 32. Where do I find the urn with the oil for the lamp? John Martin, 114 Blackmead, Orton Malborne, Peterborough, Cambs.

Lords of Time on Spectrum. I can't find a sharp sword, nor open the door on Zone 3. Olafur Gardarsson, Vesturberg 70, 109 Reykjavik, Iceland.

The Hulk on Spectrum. I can't plug the gas outlet. Olafur Gardarsson, Vesturberg 70, 109 Reykjavik, Iceland.



Top 10

Vic 20

1 (–)	Duck Shoot	(Mastertronic)
2 (1)	Perils of Willy	(Software Projects)
3 ( )	Computer War	(Thorn EMI)
4 ( )	Sub Commander	(Thorn EMI)
5 ( )	Tank Commander	(Thorn EMI)
6 (–)	Tower of Evil	(Thorn EMI)
7 (–)	Psycho Shopper	(Mastertronic)
8 (7)	Snooker	(Visions)
9 ( )	Cosmic Cruiser	(Galactic)
10 (8)	Crazy Kong	(Interceptor Micro)

(Figures compiled by Boots/Websters)

Commodore 64

1 ( )	Monopoly	(Leisure Genius)
2 (8)	Chiller	(Mastertronic)
3 (1)	Ghostbusters	(Activision)
4 ( )	Matchpoint	(Psion)
5 (8)	Scrabble	(Leisure Genius)
6 ( )	Hunchback II	(Ocean)
7 (8)	BMX Racers	(Master Tronic)
8 (6)	Jet Set Willy	(Software Projects)
9 (4)	Daley Thompson's Decathlon	(Ocean)
10 (–)	Booty	(Firebird)

(Figures compiled by Boots/Websters)

Spectrum

1 (1)	Daley Thompson's Decathlon	(Ocean)
2 (8)	Beach Head	(Centresoft)
3 ( )	Booty	(Firebird)
4 (3)	Jet Set Willy	(Software projects)
5 (–)	[illegible]	(Adventure International)
6 (–)	Skool Daze	(Microsphere)
7 (–)	[illegible]	(Elite)
8 (8)	Pyjamarama	(Mikrogen)
9 (–)	[illegible]	(Ultimate)
10 ( )	Kung Fu	(Bug Byte)

(Figures compiled by Boots/Websters)

Dragon 32

1 ( )	Mystery of Java Star	(Shards)
2 (4)	Mr Dig	(Microdeal)
3 (8)	Manic Miner	(Software Projects)
4 (1)	Hunchback	(Ocean)
5 (4)	Cuthbert in Space	(Microdeal)
6 (5)	Chuckie Egg	(A&F)
7 (3)	Dragon Chess	(Oasis)
8 (7)	Sprite Magic	(Knight Software)
9 (10)	Bug Diver	(Mastertronic)
10 (2)	Hungry Horace	(Melbourne House)

(Figures compiled by Boots/Websters)

BBC B

1 (1)	Scrabble	(Leisure Genius)
2 (2)	Elite	(Acorn)
3 (–)	Frak	(Aardvark)
4 ( )	Manic Miner	(Software Projects)
5 (–)	Mr Ee	(Micro Power)
7 ( )	Kensington	(Leisure Genius)
8 (9)	Football Manager	(Addictive)
9 (10)	Jet Pac	(Ultimate)
10 (3)	Box Office	(Database)

(Figures compiled by Boots/Websters)

Atari

1 (1)	Attack of Mutant Camels	(Llamasoft)
2 ( )	Computer War	(Atari)
3 (8)	Submarine Commander	(Thorn EMI)
4 (2)	Gridrunner	(Llamasoft)
5 (3)	Zaxxon	(Centresoft)
6 (–)	Carnival Massacre	(Atari)
7 (4)	Slinky	(Centresoft)
8 ( )	Bruce Lee	(Centresoft)
9 (8)	Decathlon	(Hi-Tech)
10 (7)	Tank Commander	(Thorn EMI)

(Figures compiled by Boots/Websters)

Amstrad

1 (–)	Football Manager	(Addictive)
2 (1)	Steve Davis's Snooker	(CDS)
3 (5)	Harrier Attack	(Amsoft)
4 ( )	Hunchback	(Ocean)
5 (8)	Forest At Worlds End	(Interceptor)
6 (7)	Star Commando	(Terminal)
7 ( )	[illegible]	(Amsoft)
8 (5)	Ghouls	(Micro Power)
9 (4)	[illegible]	(Amsoft)
10 (8)	Chess	(Amsoft)

(Figures compiled by Boots/Websters)

Diary

Event	Dates	Venue	Admission	Organisers
Which Computer? Show (over 18s only)	Jan 15-17 (1985) 10.00am-6.00pm Jan 18 10.00am-4.00pm	NEC Birmingham	Free in advance from organisers	Clapp and Poliak 01-891 [illegible]
Hi-Technology and Computers in Education Exhibition	Trade: Jan 24 10.00am-1.00pm Educationalists: Jan 24 1.00pm-5.30pm Jan 25 11.00am-5.00pm Public: Jan 26 11.00am-5.00pm	Barbican London EC2	Free in advance from organisers	Computer Marketplace 01-930 1612
[illegible] Computer Show	Feb 5-7 10.00am-6.00pm	Kensington Town Hall London W8	Free in advance from organisers	Sunshine 01-341 [illegible]
The LET '85 International Trade Show	Feb 17-18 10.00am-6.00pm Feb 19 10.00am-4.00pm	Olympia 2 London W8	Free in advance from organisers	Turret-Wheatland [illegible] 778000

Readers' Chart No 5

1	(2)	Knight Lore *(Spectrum)*	**Ultimate**
2	(1)	Daley Thomson's Decathlon *(Spectrum/C64)*	**Ocean**
3	(2)	Ghostbusters *(Spectrum/C64)*	**Activision**
4	(3)	Underwurlde *(Spectrum)*	**Ultimate**
5	(5)	Booty *(Spectrum/C64)*	**Firebird**
6	(8)	Beachhead *(C64)*	**US Gold**
7	(6)	Elite *(BBC/Electron)*	**Acornsoft**
8	(9)	Kokotoni Wilf *(Spectrum/C64)*	**Elite**
9	(—)	Raid Over Moscow *(C64)*	**US Gold**
10	(—)	Jet Set Willy *(Spectrum/C64)*	**Software Projects**

Week 5: Winners — Steven Wallbank, Wanstead Gardens, Stechford, Birmingham; Billy Smith, Thalli Road, Stafford; [illegible] Somerville, Morley Cottages, The Avenue, [illegible] Waltham, Essex; and Ronnie Fumington, [illegible] Avenue, Trust Estate, [illegible], Merseyside, who share the £50 'pot' and receive £12.50 each.

Now voting on Week 7 — £50 to win

Each week Popular is compiling its own special software top ten chart — compiled by YOU

All you have to do to vote is to fill in the form below with the names of your current three favourite software titles (or copy the form on to another sheet if you don't want to damage your magazine) and send it off as soon as possible to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

We will send £50 each week to the person who correctly predicts that week's top three. If there is no winner then that week's prize is automatically added to the chart on which voting is currently taking place, and so on until someone gets it right! (If there is more than one winner that week's prize — whatever the 'pot' stands at — will be split equally between all the correct entries.)

Voting for Week 7 closes at 2pm on Wednesday January 9 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name..

Address..

....

....

My top 3: Voting Week 7

1..

2..

3..

New Releases

CLONED

Here's a dilemma. *Technician Ted* from Hewson is the closest thing to a *Jet Set Willy* clone I've ever seen.

There are 60 screens, all fairly wacky, things to collect, a little man you must left-right-jump on to various different levels, obstacles that you can just avoid etc, etc. Even the different rooms have little names underneath them à la *Willy*.

Ordinarily I'd condemn it out of hand as boring and dull but the problem is this — *Technician Ted* is such a good clone that it stands out from all the others as actually being fun to play. It could almost be a legitimate successor to the original.

The game has the same touches that made *Jet Set Willy* so clever and professional — precise collision detection, very carefully constructed screens (you can always just manage the obstacle), nicely designed sprites.

Against my better judgement I liked the game. *Jet Set Willy* fans will find it an extremely acceptable stop-gap until *Willy* part three comes out.

Program *Technician Ted*
Price *£5.95*
Micro *Spectrum*
Supplier *Hewson Consultants*
56b Milton Trading Estate
Milton
Abingdon
Oxon

BLOCK MOVE

Fmon is a machine-code monitor for the BBC that has enough basic features to be more or less the only machine code utility you'd need for small machine-code programming jobs.

The *Fmon* monitor includes within its 5.5K a code relocator, a line assembler, variables that can be user-defined, procedures, and a fairly powerful disassembler.

The monitor has what almost amounts to its own programming language — single letter commands can be linked together to form what are virtually procedures which can be saved on tape. There is also a facility for using the system variable values within a function for tasks like block moves, string searches and so on.

A useful utility.

Program *Fmon*
Price *£8*
Micro *BBC*
Supplier *Fsoft*
PO Box 352
Brighton BN1 3AY

OPPOSITE

I've always found the Mr Men intensely irritating, but you have to admire Mr Marketing's talent. Mirrorsoft has stamped the Mr Men into every one of its educational releases and given the range a visibility (deserved) which it might not otherwise have had.

Latest addition is *Word Games with the Mr Men* which features twin cassettes — *Mr Noisy's Word Game* and *Read with Mr Bounce*. Both teach simple English to young children and make use of a simple overlay to sort out the various Spectrum keys — something we are all in need of.

Mr Noisy uses animated graphics to illustrate the meaning of opposites, comparatives and superlatives. Mr Bounce explains position words — like, into, on, next and under — by bouncing around the screen. It's a pleasing package and the programs are well written, all you have to do is persuade your kids to use it.

Program *Word Games with the Mr Men*
Price *£9.95*
Micro *Spectrum*
Supplier *Mirrorsoft*
Holborn Circus
London EC1P 1DQ

GEOMETRIC

Activision has recently released *The Designer's Pencil*, a drawing utility for the Spectrum that is virtually a dedicated programming language. The program uses a system of menus which enables you to manipulate graphics in a variety of complex ways. It isn't merely a matter of the usual ink, paper, left right up down, fill: what you get is far more like turtle graphics.

You can draw a shape, and using a series of loops and other commands, have it repeated over the screen in an organised pattern. There are commands to write text, change drawing speed, fill an area, draw various different sorts of lines, circles, colours and other effects. Like Basic, you can use variables to stand for numbers and in that way change the drawing position in an orderly way — very good for geometric style patterns.

To get the most from the program, you'll need to spend a little time with it, but it looks a lot of fun to me.

Program *The Designer's Pencil*
Price *£9.99*
Micro *Spectrum*
Supplier *Activision*
15 Harley House
Marylebone Road
London NW1

HEATED

Educational software is a difficult thing to do well and mostly it isn't done well. The only successful programs are those which restrict themselves to providing simple tasks and pretty pictures for the under fives. So 'O' level physics on the Spectrum at least gets a vote for not taking the easy option.

The program is basically concerned with the heat and light sections of the 'O' level syllabus, the sections follow the obvious format of following a tutorial section with some multiple choice questions.

The light section is actually quite well done with quite a few sections featuring ray diagrams and the like — it could be genuinely useful if you treat it as a revision device, but doesn't really use the computer to do anything clever.

Program *Light and Heat*
Price *£6.95*
Micro *Spectrum*
Supplier *Rose Software*
148 Widney Lane
Solihull
West Midlands

ALTITUDE

Flight Path is an aeroplane simulation program with a difference, you do not have to master the fine tuning of dozens and dozens of controls rather you have to plan the journey in advance and then watch the results.

The program is intended very much as an educational exercise in making reliable calculations and planning ahead, but is still fun for all that.

First you must chose the flight route, taking note of factors like weather conditions, aircraft type and usual flying altitude. Then the distance and bearing of the various journey airports must be calculated with wind speed included.

Having set up the plan, you set your aircraft and, as likely as not, plummet into the sea (since this is a game for schoolkids you don't actually plummet into the sea — you get rescued. Personally, however, I'd like a plummet option.) Ingenious, original and even marginally educational.

Program *Flight Path*
Price *£9.95*
Micro *BBC B*
Supplier *Storm Software*
Winchester House
Sherborne
Dorset

New Releases



PASS GO

After a few illicit editions, notably Automata's *Go To Jail*, an 'official' version of computer *Monopoly* has arrived.

The manufacturer is Leisure Genius which is steadily working its way through the entire Waddington's catalogue.

There will soon be versions for all the major home computers but the first one is for the Commodore 64.

What it does, obviously, is play *Monopoly* but the screen is displayed — either against the computer or against other players — in a most appealing way. The complete board is displayed edge-on with perspective in one half of the screen giving a general guide to what's where and what is coming up. In the bottom of the screen is the detailed display of the two or three squares around your playing piece; this scrolls along as the piece is moved according to the dice throw.

Most of the tedious elements of the game are removed — if you land on a property the computer asks if you want to buy it and automatically debits your account. Similar credits and debits like collect 200 pounds for passing go and so on happen automatically.

The computer seems to play very sensibly and will bid deftly in the auction should a property be up for grabs. The graphics are neat and traditional, ie, boot, car, ship, etc.

I still don't know why those objects were originally chosen. I mean does anybody ever voluntarily choose the boot?

Program *Monopoly*
Price *£1 95*
Micro *Commodore 64*
Supplier *Winchester Holdings, 3 Montagu Row, London W1H 1AB*

FIREHALL

Whilst there are some doubts over just what role the plus 4 is going to play, the C16 seems to be doing pretty well. As yet there aren't that many programs from independent suppliers, but that situation should change.

Skramble is one of the first releases, works on both the C16 and the Plus 4 and comes from Anirog.

Skramble is one of those inevitable games that never fails to turn up, you can safely say that any micro lacking a version of *Skramble* three weeks after its release is going to be a dodo.

Skramble involves flying an aircraft over various sectors of heavily armed landscape, so you have to combine extremely deft flying so as not to hit passing mountains with even more deft leaping about to dodge missiles, UFOs, fireballs and all that.

It goes on and on, getting

Pick of the week

DREAD MAZE

Remember the megagames? Animated epics that required extra memory to work. Remember Imagine? The company that mixed financial unsoundness and flash cars in about even measures? The programmers primarily responsible for working on the megagames are now working as an independent unit producing epics for other, less ruinously flamboyant companies — the first fruit of their labours to see the light of day is *Gift from the Gods*, produced for Ocean.

The game is excellent which makes its late (for Christmas) and relatively unexpected release particularly surprising. Maybe it was just ready sooner than expected. It has something of the style of *Tir Na Nog*, but with greater arcade elements — there are more things to dodge and slash at (using Ajax's sword) and more happens more quickly (which is not necessarily a virtue, just a fact).

The game features a number of Stars of Greek Myth; Orestes — under your control, Clytaemnestra — wicked Alexis type character who wants to do in her own kids, Agamemnon — who was himself done in and whose death must be avenged and Electra — Orestes' sister, who is pretty tough and can help Orestes in his search. If

This Week

Program	Type	Machine	Price	Supplier
Back-up Utility	Ut	Amstrad	£6.95	Mentasa
Flight Path	S	BBC	£5.95	Storm
Skramble	Arc	C16	£6.95	Anirog
1985	Arc	Commodore 64	£1.99	Mastertronic
Big Ben	Arc	Commodore 64	£7.95	Interceptor
Edge Mission	Arc	Commodore 64	£7.95	Anirog
The Love's Catchal	S	Commodore 64	£8.95	Peaksoft
Space Walk	Arc	MSX	£1.99	Mastertronic
Chiller	Arc	Spectrum	£1.99	Mastertronic
Finders Keepers	Arc	Spectrum	£1.99	Mastertronic
Formula 1 Simulator	S	Spectrum	£1.99	Mastertronic
Ghostbusters	Arc	Spectrum	£9.95	Activision
Gift of the Gods	Arc	Spectrum	£9.95	Ocean
The Great Space Race	Arc	Spectrum	£14.95	Legend
Take Care of Your Teeth	Ed	Spectrum	£5.50	Deva
Continents and Oceans	Ed	Spectrum	£4.50	Deva
Lock Keeper	Ed	Spectrum	£5.50	Deva
Ranks	Ed	Spectrum	£4.50	Deva
Word games w Mi Men	Ed	Spectrum	£4.95	Microcraft
Quarterback	S	Spectrum	£3.95	Nab software
Designer's Pencil	Ut	Spectrum	£9.95	Activision

Key Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

you find her, she can lead you to useful places in the catacombs that form the playing area of the game. The task is to find six special symbols that, when arranged in the correct order in a special room, will release everyone from the dread maze. This is made difficult because there are various illusions designed to prevent their discovery

There are various puzzles scattered about the maze and danger lurks in the form of monsters and the evil Clytaemnestra who will do what she can to confuse you and kill Electra. To help you find your way around the maze, you have seven tears which may be used to mark rooms The graphics are excellent, although colour attribute problems rear their sickeningly multi-coloured head occasionally. The backgrounds are a little samey too, but it's compulsive as a game and fairly original.

Program *Gift from the Gods*
Price *£9.95*
Micro *Spectrum*
Supplier *Ocean Software*
6 Central Street
Manchester M2 5NS

ever more difficult and many people love it. This version is OK, but not great

Program *Skramble*
Price *£8.50*
Micro *C16*
Supplier *Anirog Software*
Victoria Industrial Park
Victoria Road
Dartford
Kent DA1 5AJ

STRATEGIC

Go, the deceptively simple but strategically ingenious board game, has been adapted for the computer relatively few times — perhaps the algorithms to get the computer to play a good game are rather complex.

Possibly the best *Go* for the computer has just been released by Acornsoft — the winner of a competition to find the best implementation of the game

The object of *Go* is to win territory and capture enemy stones (the playing pieces) To win a stone or stones you simply surround it with opposing pieces.

With just a couple of other simple rules the game develops, with practice, into an astonishingly complex and subtle game requiring much pondering and consideration. And the computer plays well — too well for me, anyway

Even if you are unfamiliar with *Go* as a board game but generally enjoy playing chess, scrabble and other traditional games on your computer you should find it very compelling

Program *Go*
Price *£9.90*
Micro *BBC*
Supplier *Acornsoft*
Betjeman House
104 Hills Road
Cambridge CB2 1LQ

GNASHERS

What does teeth care mean to you? Do you ever think about your teeth? Have you ever thought of linking your teeth to your computer? Well, the long days of waiting are over, open your mouth and switch on. *Caring for your Teeth* has arrived.

What you get is basic text book style information presented with graphics which are mainly static, although there is the occasional Pacman who wanders on and says nasty things that threaten the state of your teeth.

It's marginally better than simply having a textbook with pictures and has a little multiple choice test at the end. For teachers only, though, methinks.

Program *Caring for your Teeth*
Price *£5.50*
Micro *Spectrum*
Supplier *Deva Educational Software*
33 Upton Drive
Chester
CH 2 1BY

CONUNDRUM

The Staff of Zaranol is an adventure from CCS intended for those addicts that are more interested in the pure problem and conundrum solving type of adventure than the ones with many locations or graphics.

There are a mere 45 locations but the clues are hidden so deviously that the adventure should take ages to solve

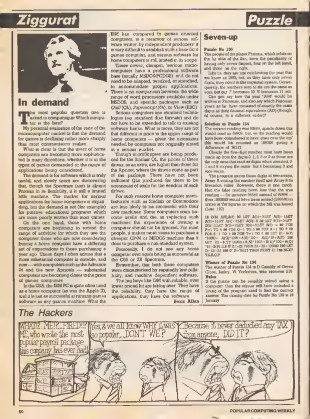
The plot is vaguely sorceror's apprentice inspired — you serve the mighty Zaranol (who sounds more like a disinfectant than a mighty sorcerer) and let loose an unpleasant demon. Aided by your helper Lan, you discover that you need to know a series of facts before the demon is banished — all you have to do is find them.

The language analysis is basic verb-noun with a vocabulary of under 30 verbs — not spectacular but then it's not meant to be technically astounding — just very hard to solve.

Program *The Staff of Zaranol*
Price *£5.95*
Micro *Spectrum*
Supplier *CCS*
14 Langton Way
Blackheath
London SE3 7TL

This Week

Activision, 15 Harley House, Marylebone Road, London NW1, 01 486 7588 **Anirog,** Victoria Industrial Park, Victoria Road, Dartford, Kent DA1 5AJ, 0322 92513 **Deva,** 33, Upton Drive, Chester, CH2 1BY **Interceptor,** Lindon House, The Green, Tadley Hampshire, 07356 71 145 **Legend,** P O Box 435 Station Road, London E4 7LY, 01-524 8324 **Mastertronic,** Park Lorne, 111 Park Road, London NW8, 01-402 3316 **Mirrorsoft,** Mirror Group, Holborn Circus, London EC1P 1DQ, 01-353 0246 **Montana,** Duffryn High School, St Bride's Road, Newport, Gwent **Nab Software,** 7 Oakwood Drive, Aspley, Nottingham NG8 3LZ, 0602 295571 **Ocean,** 6 Central Street, Manchester M2 5NS, 061 832 6633 **Peaksoft,** 48 Queen Street, Balderton, Newark, Notts NG24 3NS, 0636 705230 **Storm,** Winchester House, Sherborne, Dorset, 0935 813628



Ziggurat

In demand

The most popular question one is asked in computing is: Which computer is the best?

My personal evaluation of the state of the microcomputer market is that the demand for games is declining rather more sharply than most commentators realise.

What is clear is that the users of home computers are becoming more sophisticated in many directions, whether it is in the types of games demanded or the range of applications being considered.

The demand is for software which is truly useful, and slowly users are discovering that, though the Spectrum (say) is almost Protean in its flexibility, it is still a limited little machine. The market for serious applications for home computers is expanding, but the demand is not (for example) for putative educational programs which are more poorly written than most games.

On the one hand, those with home computers are beginning to extend the range of activities for which they use the computer: those who are now considering buying a home computer have a differing set of expectations to those purchasing a year ago. These days I often advise that a more substantial computer is suitable, and now — with computers such as the Advance 86 and the new Apricots — substantial computers are becoming closer to the price of games computers.

In the USA, the IBM PC is quite often used as a home computer (as was the Apple II), and it is just as successful at running games software as any games machine. What the IBM has compared to games oriented computers, is a reservoir of serious software written by independent producers: it is very difficult to establish such a base for a games computer, and serious software for home computers is still limited in its scope.

These newer, cheaper, 'serious' microcomputers have a professional software base (usually MSDOS/PCDOS) and do not need to be adapted, tweaked, or stretched, to accommodate proper applications. There is no comparison between the wide range of word processors available under MSDOS, and specific packages such as *Quill* (QL), *Superscript* (64), or *View* (BBC).

Serious computers use standard technologies (eg standard disc formats) and do not have to be extended to talk to existing software banks. What is more, they are not that different in price to the upper range of home computers — given the extensions needed by computers not originally aimed at a serious market.

Though microfloppies are being produced for the Sinclair QL, the prices of these drives, as an extra, are higher than those for the Apricot, where the drives come as part of the package. There have not been sufficient QLs produced for there to be economies of scale for the vendors of such drives.

For such reasons home computer manufacturers such as Sinclair or Commodore are less likely to be successful with their new machines. Home computers soon become senile and die. In replacing such machines the experience of owning a computer should not be ignored. For most people, it makes more sense to purchase a cheaper CP/M or MSDOS machine than it does to purchase a non-standard system.

Personally, I do not see any home computer ever again being as successful as the C64 or ZX Spectrum.

Remember, that both these computers were characterised by reputedly low reliability, and machine dependent software.

The big boys like IBM with reliable, ever lower priced kit are taking over. They have the reliability, they have the range of applications, they have the software.

Boris Allan

Puzzle

Seven-up

Puzzle No 138

The people of the planet Plutonia, which orbits on the far side of the Sun, have the peculiarity of having only seven fingers, four on the left hand, and three on the right.

Like us, they are just celebrating the year that we know as 1985, but, as they have only seven digits, they count in the septimal system. Consequently, the numbers zero to six are the same as ours, but our '7' becomes '10', '8' becomes '11' etc.

Can you say how the year '1985' would be written in Plutonian, and also say which Plutonian years so far have consisted of exactly the same digits as their decimal equivalents (AD) (though, of course, in a different order)?

Solution to Puzzle 134

The correct reading was 90689, upside down this would read as 68906, but, as the reading would have been considered to have 'gone over the top' this would be counted as 168906 giving a difference of 78217.

Clearly the five-digit number must have been made up from the digits 0, 1, 6, 8 or 9 as these are the only ones that read as digits when inverted, 0, 1 and 8 staying the same but 6 becoming 9 and vice-versa.

The program stores these digits in two arrays, Array A storing the number itself and Array B its inversion value. However, there is one catch. Had the false reading been less than the true reading — for instance 06888 instead of 88890 — then 100000 would have been *added* (188890) to arrive at the figures on which the bill was based (Line 110).

```
10 DIM A(5),B(5) 20 LET A(1)=0:LET A(2)=1:LET
A(3)=6:LET A(4)=8:LET A(5)=9 30 LET B(1)=0:LET
B(2)=1:LET B(3)=9:LET B(4)=8:LET B(5)=6 40 FOR
P=1 TO 5 50 FOR Q=1 TO 5 60 FOR R=1 TO 5 70
FOR S=1 TO 5 80 FOR T=1 TO 5 90 LET Z1=A(P)
*10000+A(Q)*1000+A(R)*100+A(S)*10+A(T) 100
LET Z2=B(T)*10000+B(S)*1000+B(R)*100+B(Q)
*10+B(P) 110 IF Z1>Z2 THEN Z2=Z2+100000 120 LET
D=Z2-Z1 130 IF D=78217 THEN PRINT Z1 140 NEXT
T,S,R,Q,P
```

Winner of Puzzle No 134

The winner of Puzzle 134 is D Cassidy of Green Close, Batley, W Yorkshire, who receives £10.

Rules

If the puzzle can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer. The closing date for Puzzle No 138 is 18 January.

The Hackers


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